PLACENTA PRAEVIA.

Present Day Views regarding Placenta Praevia with special reference to Treatment, and including an Analysis of 192 cases admitted to the Edinburgh Royal Maternity Hospital during the five years 1923-27.

by

ALISON RITCHIE, M.B., Ch.B.

THESIS FOR THE DEGREE OF M.D.

October 1928.

A placenta, the implantation of which encroaches upon that part of the uterus which will afterwards become the lower uterine segment, is termed Placenta Praevia. Of this, there are three varieties: (a) Central, where the placenta completely covers the os; (b) Marginal, where the placenta reaches the margin of the internal os; (c) Lateral, in which the edge of the placenta dips into the lower uterine segment. The two last are often grouped together as Partial Placenta Praevia, on account of the arbitrary nature of the words lateral and marginal, which, by different observers, are respectively used to denote different degrees of praevia, at unstated degrees of dilatation of the internal os. It may here be observed that such terms may be misleading unless at the same time the size of the os is stated, for it follows that a placenta which may be felt to cover the os completely when it is dilated to admit one finger, may only partially cover it by the time the os has reached the size of a tea-cup. The words Central and Partial will here be employed to describe the situation of the placenta, as it would be recognised Clinically with the os dilated to one finger. Often

when/

when the patient is first seen the os is further dilated, and in these cases the relationship between the placenta and the cervix at a "one finger" dilatation has to be assumed.

That placenta praevia is a serious condition for both mother and child is shown by the mortality figures obtained by taking the average of 20 observers, the maternal mortality being 10.6% and the foetal mortality 50%. The incidence amongst hospital cases is approximately 1.2%.

Whilst the variety of praevia, the amount of blood loss, and the general condition when first seen, have considerable bearing upon the prognosis for the mother, judicious treatment is undoubtedly an important factor. It is to this side of the subject that most attention will be directed in this paper, in the hope that further light may be shed upon the right choice of method of treatment under varying circumstances. With this in view, the findings of a number of observers will be compared with the findings resulting from an analysis of 192 consecutive cases, which have been admitted to the Edinburgh Royal Maternity Hospital, during the past 5 years 1923-27, inclusive.

FREQUENCY.

The incidence of placenta praevia is difficult to estimate, for, in quoting its frequency, many writers omit to state whether the source of their figures was derived from private or hospital practice, or from both. Suitable equipment and facilities are rarely available for dealing adequately with such a major obstetrical complication in domestic practice. Cases are accordingly referred to hospital, and thus the hospital incidence is raised in proportion to that in private practice.

Taking the average of the figures in the following Table I, placenta praevia would seem to occur in 1.15% of hospital cases, but the actual incidence is seen to vary from 3.0% to 0.26%. It will be noticed that the incidence in the Edinburgh Royal Maternity Hospital is the second highest on the list, namely 2%, the highest, 3%, being that incidence quoted by Calderon and Villarama.

TABLE I./

TABLE I.

Incidence of Placenta Praevia.

Observers	Total No. of Cases.	% Cases of Placenta Praevia.	% Primigravid patients with placenta praevia.
Bauer	18,662	1	20.0
Liebe (1)	10,063	0.87	
(2)	4,806	1.0	
Hjelt	37,197	0.32	
Mikulicz	9,608	1.74	16.0
Lieberman	1,928	1.0	18.9
Conrad	21,000	0.97	
Costa & Landa	19,450	1.04	
R.K. Smith	4,00	0.68	
Calderon & Villarama	10,462	3.0	
Barney	8,160	0.26	
Edin. Royal Maternity Hospital.	8,239	2.0	
	12	13.8	

Average % = 1.15

ETIOLOGY.

Various theories have been advanced regarding the causation of placenta praevia.

THEORIES.

Some writers maintain that the normally implanted ovum undergoes separation from its attachments and falls to the lower part of the uterus where it acquires new connections. In association with this, it is believed that the uterine cavity having been enlarged by chronic subinvolution, the ovum is free to slide down to the internal os. Another view suggests that the trophoblast develops at a late stage, when the ovum has had time to pass further down the interior of the uterus than normally. These three views all assume that the ovum is falling by gravity towards the lower pole of the uterus, but, it is argued that this is impossible, since at the time of conception, the uterus is normally so anteflexed that the region of the internal os is at a higher level than the fundus. The theories may or may not be correct, but surely this argument against them is untenable. In the first place, it is doubtful whether the uterus is so anteflexed that the fundus is at a lower level than the internal os, and secondly, even if this be the case normally, may not placenta praevia occur in the abnormal cases in which the uterus is

in/

in a more upright position?

Williams, quoting Strassmann, points out that one of the most important factors in the development of placenta praevia is defective vascularisation of the decidua, produced by inflammatory or atrophic changes, so that in order to obtain sufficient blood supply for the nutriment of the ovum, the placenta has to attach itself over a larger area, and so occasionally it may spread to a region nearing the internal os. This idea is suggestive, because, undoubtedly, in placenta praevia, the placenta is increased in its diameters, is at the same time thinner, and occupies a larger area of attachment than usual. Williams mentions one of his cases of placenta praevia in which the uterus was examined post-mortem and the placenta found to occupy $\frac{4}{5}$ ths of the interior.

Hofmeier and Kaltenbach are reported to suggest that a part of the placenta, instead of developing normally from the interdigitation of the chorion frondosum with the decidua basalis, develop in connection with the decidua capsularis, and that this portion, as pregnancy advances, gradually bridges over the internal os, and fuses with the decidua vera, afterwards establishing vascular connections. Williams quotes Von Weiss, Ponfick, Kermaßner and Lobhardt as reporting exceptional cases, where a part of the placenta developes upon the upper portion/

portion of the cervix, instead of bridging over the internal os.

The views of Strassmann and Hofmeier are the most generally accepted at the present day. It is difficult to see how with our present knowledge we can come nearer to ascertaining the cause, since it is impossible to take sections of the uterus with placenta praevia and ovum in situ, at various stages of development.

But if we cannot determine precisely its etiology from an anatomico-histological standpoint, we have knowledge of certain clinical causative factors about which most workers on the subject are agreed.

PARITY.

First, undoubtedly the condition is more liable to occur in multiparous than in primigravid women. Thus, in Bauer's cases only 20% occurred in primiparae, in those of Mikulicz and Lieberman 16% and 18.9% respectively, though the latter quotes Magyrier at the Bandeloque Clinic to have as many as 46.6%. Hjelt gives his percentage as 17.8, and Conrad as 20.2. In the present series of 192 cases of placenta praevia, 28 were primigravida = 14.5%, while of 8239 patients, the total number delivered in the Edinburgh Maternity Hospital 1923-27, 43.4% were primiparae. This gives a difference of 28.9% between/

TABLE II.

No. of Cases in relation to parity.

Parity	No. of Cases.	%	No. of Cases	%
0	28	14.5		
1	25	13		
2	27	15	52	= 27.5%
3	26	13.6		
4	14	7	40	= 20%
5	18	9		
6	12	6		
7	12	6		
8	11	5.7		
9	5	2.6		
10	3	1.5		
11	5	2.6		
12	4	2		
13	1	0.5		
17	1	0.5		

Total No. = 192 = Average of 3.9 labours per patient.

between the percentage number of primigravid patients suffering from placenta praevia and the number of primiparous women among the total deliveries. Lieberman's figures show that the majority of the cases occurred in women para 0 to 4; the highest incidence was in women para 2, his average numbers of labours per patient being 4.033. He gives Strassmann's average number as 6.38. In my series, as seen in Table II, the largest number occurred in women para 0-4, but my highest number actually was that of primigravida, my average number of labours being 3.9%, that is, lower than the figures given by the other two observers.

Not only do many fewer cases of placenta praevia occur amongst primigravidae, but the incidence increases with the number of children borne. Lieberman and Williams illustrate this by figures which Doranth based upon 30,796 labours in Chrobak's Clinic. The incidence was 0.17, 0.48, 1.37, 1.28, 3.39 and 5.5% according as the patients had given birth to 1, 2, 3, 4, 5, or 6 children.

MULTIPLE PREGNANCIES.

Placenta praevia is said to be more frequent in multiple pregnancies. Of this I can find no proof from actual figures. In my series there were 3 cases of twins = 1.5% of the cases of placenta praevia, the total number of twins/

TABLE III.

Age Incidence.

Age.	Total No. of Cases.	%	Primigravida. No.	%
15 to 20 yrs.	3	1.5	3	10.6%
20 " 25 "	37	14	10	35.5
25 " 30 "	43	22	8	29
30 " 35 "	51	26	5	17.9
35 " 40 "	45	23	1	3.5
40 " 45 "	13	6.6	1	3.5
	192			

twins in the 5 years being 116 or 1.3%, so that here the difference of 0.2% is practically negligible. But the placenta always occupies a larger area in the uterus in multiple pregnancies, and it is therefore reasonable to suppose that the lower uterine segment may be encroached upon more often than in single pregnancies.

AGE INCIDENCE.

Regarding the age incidence, there is only a slight degree of variation between the figures of different observers. Lieberman found the average age of his patients to be 29.02 and gives Strassmann's as 32.9 yrs. As seen from Table III in my series, the highest percentage of cases occurred between the ages of 30 and 35 years, grouping primigravid along with multiparous patients. Amongst primiparae alone, the largest number occurred between the ages of 20 and 25 years.

RAPIDITY OF CHILDBEARING.

Then also, placenta praevia is favoured by the rapidity with which pregnancies follow one another. Lieberman says that in 18.9% of his series, there were "closely repeated pregnancies". In the Edinburgh Maternity Hospital series there were 164 multiparae. Of 71 cases in which clear notes were taken of the dates of previous pregnancies, 43 or 60.5% had had labours/

labours which had followed one another within two succeeding years.

ASSOCIATION WITH ABORTION.

James Young finds that a patient suffering from placenta praevia may often give a history of having previously had a premature labour or abortion, and cites the following case as a good example of a common recurrence sequence:-

1st and 2nd pregnancies - premature labours 3rd abortion, 4th placenta praevia , as if there was some common abnormal basal factor in these cases affecting the attachment of the ovum, and revealing itself in one or other of these three ways.

But if abortion and premature labour occur often in the past history of a patient with placenta praevia, still more frequently do they occur apart from it, since abortion is the result in about every 6th pregnancy, and premature labour is a very common occurrence. Hence it would appear that abortion or premature labour occurring in the history of a patient suffering from placenta praevia is merely incidental and has no further significance.

HISTORY OF PREVIOUS PLACENTA PRAEVIA.

A history of previous placenta praevia is an interesting incident in some cases. In 2 cases = 1% of my series there was a history of previous placenta praevia/

praevia , and in addition three gave a history of antepartum haemorrhage which might have been due to placenta praevia. Gilliatt reports a case of a woman aged 32 who had placenta praevia 4 times in 4 consecutive pregnancies, the deliveries all taking place between the 28th and 32nd weeks. He also quotes E.H. Fitzpatrick who had 5 cases in 5 succeeding pregnancies. But the most interesting account of recurrent placenta praevia appeared in the British Medical Journal in Jan. 1928 where a woman now aged 40 had placenta praevia 4 times in succession. The 1st was the 10th pregnancy occurring March 1922, the patient being delivered at the 6th month of gestation, the second in May 1922 - delivery at the 7th month, the third in April 1925 - delivery at the 8th month, the fourth in Nov. 1927 - delivery at the 9th month. It would be interesting to know what happened if she became pregnant again. It looks as if, having reached the stage in the cycle of her pregnancies when she had placenta praevia, with each succeeding pregnancy it was becoming less central, and in fact that she was becoming less liable to have a placenta praevia.

ASSOCIATION WITH "ENDOMETRITIS".

De Lee asserts that in nearly all his cases of placenta praevia a history was obtained of abortion, a slow recovery from confinement, manual removal of placenta/

placenta in previous labours, recurrent placenta praevia or other evidences of a diseased endometrium, the findings in the placenta confirming endometritis as the predisposing factor, i.e. white infarcts, very thick serotina, or adherent placenta were found.

Lieberman considers that "endometritis" plays an important part in the etiology and declares that 54.43% of his 79 cases suffered from this. He assumes this because 19 gave a history of previous instrumental deliveries, 15 of closely repeated pregnancies, 2 of previous puerperal infection, 7 of previous placenta praevia, 4 of obstetrical interference on account of abnormal presentations, and 2 of eclampsia. Coincident with these abnormal histories, on physical examination, there was found a relaxed perineum or lacerated cervix. His assumption might have carried more weight had he defined what he meant by the somewhat vague term "endometritis", and if he had given his reasons for concluding that closely repeated pregnancies and previous puerperal infection should leave this same condition in the uterus.

ADDITIONAL REMARKS.

Many of the notes on the previous histories of the present series were incomplete, but the following facts of interest seem to be worth recording, in addition to those already mentioned.

POINTS/

POINTS OF NOTE IN PREVIOUS HISTORIES.

Eclampsia	2 cases
Nephritis	1 "
Carneous mole	1 "
Hydramnios	1 "
"White leg"	1 "
Puerperal sepsis	3 "
Postpartum haemorrhage	3 "

CLINICAL FEATURES.

There now falls to be considered the clinical manifestations of placenta praevia.

INCIDENCE OF TWO TYPES OF PRAEVIA.

As previously explained, there are two main types, the Central and Partial variety of praevia. Of these, the partial is the commoner. Mikülicz, among his total 168 cases of placenta praevia, had 52 cases of the central type, that is 32%. Hjelt in his 118 cases had 19.4% with the placenta centrally situated, Calderon and Villarama had in 314 cases:- 50 central, i.e. 16.2, 267 partial, i.e. 83.8%, 7 of unknown situation. Lieberman in 79 cases had 23 central = 27.8%, 55 partial, and 1 unknown. In my series of 192 the placenta was central in 42 = 21% of the cases. Thus the percentage figure for central placenta praevia varies between 32%, the figure given by Mikulicz, and 16.2% that quoted by Calderon and Villarama. The importance of the situation lies, as will be shown later, in the influence which it exerts upon the choice of treatment, and the maternal and foetal mortality.

SIGNS AND SYMPTOMS.

Characteristically, the condition displays but one symptom, painless haemorrhage.

This/

This usually appears after the 7th month of gestation, although it may occur as early as the 3rd month, probably in many cases being the unrecognised cause of abortion. The symptom may be accompanied by a feeling of uneasiness in the lower abdomen, especially if any blood clot be retained in the lower uterine segment or vagina, but more frequently, there is no disturbance other than haemorrhage, which often occurs when the patient is asleep. She wakes to find the bedclothes moist, and finds to her surprise that she is lying in a pool of blood. The initial haemorrhage may be so profuse as to prove fatal, but in the majority of cases it either ceases spontaneously to recur at a later date, or does not stop entirely, there being a small continuous discharge of blood-stained fluid. There may be no haemorrhage until labour starts.

On examination the abdomen is seen to be not unduly increased in size; palpation over the uterus reveals no tenderness, but frequently there will be a malpresentation of the child, and in a primiparous patient even when the vertex is presenting, the head will be found not engaged. In a multipara, there may be difficulty in pushing the head into the brim, or if labour has commenced the head may be slow to engage. The findings on vaginal examination will depend upon the degree of dilatation of the os; usually/

usually it will at least admit one finger. If the os admits 2 fingers, probably blood clot will be first encountered. This having been removed, the examining finger may meet with a boggy substance of sponge-like consistency. If nothing but placenta is palpated in relation to the internal os, the diagnosis is central placenta praevia; if in addition smooth membranes are perceived, marginal placenta praevia may be diagnosed. If smooth membranes bridge across the internal os, but by sweeping the fingers round the adjacent lower uterine segment an edge of placenta can be felt, then the diagnosis is one of lateral placenta praevia.

HAEMORRHAGE.

ANTEPARTUM.

Mikulicz found that haemorrhage took place within 10 days of term in 52% of his cases, in 18% at the 9th lunar month, 15% at the 8th month, and 2% at the 10th month. In 17% the haemorrhage was severe, in 21.8% profuse, 18.5% moderate, 41% slight.

Lieberman states that in 68.35% of his cases there was a history of haemorrhage occurring during the last 3 months of gestation. Without definition of terms, he subdivides his partial variety of praevia into marginal and lateral types, and finds that in his series the highest percentage of cases with profuse haemorrhage occurred in his lateral group = 36.7%, as compared with 26.58% in the central group, and/

TABLE IV.

Time of Onset of first Haemorrhage.

th of Gestation when 1st norrhage occurred.	No. of cases Partial and Central.	%	No. of Cases Central	% of whole		No. of cases Partial.		%
$3\frac{1}{2}$	7	3.6	1	14	)	6	)	
4	7	3.6	1	14	)	6	)	
$4\frac{1}{2}$	1	.5	1	100	) 25.5%	0	)	18.7%
5	10	5.0	3	30	)	7	)	
$5\frac{1}{2}$	2	1.0	1	50	)	1	)	
6	12	6.0	4	33	)	8	)	
$6\frac{1}{2}$	9	4.6	1	11	)	8	)	
7	21	10.6	9	43	)	12	)	
$7\frac{1}{2}$	22	11.0	6	28	) 74.5%	16	)	81.3%
8	39	20.3	8	21	)	31	)	
$8\frac{1}{2}$	18	9.0	3	17	)	15	)	
9	44	22.0	4	9	)	40	)	

	All Cases.		
Recurrent Haemorrhage	87	=	45%
Single Haemorrhage	105	=	54.6%

	Central Cases		
Recurrent Haemorrhage	29	=	69.1%
Single Haemorrhage	13	=	30.9%

and 20.25 in the marginal group.

Conrad asserts that in 50% of his cases, haemorrhage did not occur until within 10 days of term.

In the present series, in 153 cases = 74.57%, haemorrhage occurred within the last 3 months of gestation.

There was a single haemorrhage in 103 = 54.6% of the cases, and in 87 cases the haemorrhage was recurrent. Under the "single haemorrhage" group are included those cases in which haemorrhage did not cease entirely, but in which there was a persistent ooze. Although haemorrhage was recurrent in only 45% of the total number of cases, there were about twice as many cases of recurrent haemorrhage in the central as in the partial variety, namely 69.1% as against 30.9%. As seen in Table IV, I found that in 25.5% of the cases of central placenta praevia, haemorrhage occurred during the first 6 months of gestation, while in only 18.7% of the cases of partial placenta praevia did haemorrhage occur during that period. Haemorrhage was severe in 66.6% of the cases of the central variety of praevia, moderate in 28.5%, and slight in only 4.7%. In the partial type, haemorrhage was severe in a percentage lower by 22% than in the central i.e. 44.66%, moderate in a percentage lower by 7% i.e. 21.6%, slight in 19.3%. Taking both types of praevia together, haemorrhage was severe in 51%, moderate in 34%, slight in 15.8%.

To recapitulate, the distinctive features of haemorrhage in central as opposed to partial placenta praevia, as manifested by my results are that haemorrhage (a) is more likely to occur at an early stage of pregnancy; (b) has a greater tendency to be severe; (c) is more liable to be recurrent.

CAUSE OF HAEMORRHAGE.

1. Before the Onset of Labour. The explanation of haemorrhage occurring before the onset of labour is clear when it is considered that during the last 3 months of pregnancy, the lower pole of the ovum begins to separate from the lower uterine segment. According to Pinard, the intermittent contractions which are always going on in the pregnant uterus, become gradually stronger, and although painless, they exercise a dilating force upon the lower uterine segment, sufficient to cause slight separation of the placenta, leading to profuse haemorrhage. In confirmation of this, it is found that the os usually admits one finger in the later weeks of pregnancy in multiparous patients, and often in primigravid patients. Where the placenta has developed in connection with the decidua capsularis, the tissue is devoid of all support where it bridges over the internal/

internal os, so that the least alteration in the surrounding parts will serve to open up the inter-villous spaces.

2. During Labour. It has been remarked that haemorrhage often only starts with the beginning of labour, and that this is more liable to happen in cases of marginal placenta praevia. It can readily be inferred how haemorrhage thus takes place: the process by which it occurs is simply an exaggeration of what happens before the onset of labour, the opening up of the os at this stage gradually exposing the placenta and raw uterine surface of attachment.

3. During the 3rd Stage of Labour. Haemorrhage is of frequent occurrence in the 3rd Stage of labour. To follow the process by which it occurs, the difference in action between the upper part of the uterus and the lower uterine segment must be recalled. The upper part plays an active rôle undergoing intermittent contractions and retractions, so that the area of placental attachment becomes smaller and smaller, the elastic muscle fibres of the uterine wall compressing the gaping vessels. The lower uterine segment on the other hand plays a passive part. In it, no contractions occur, but it gradually becomes stretched so that its surface extent becomes greatly increased. Thus it happens that a placenta in contact with/

with the lower uterine segment, being unable to expand in correspondence with its site of attachment, becomes separated from the uterine wall, and haemorrhage from the maternal surface occurs, it being impossible for the stretched muscle fibres to seal off the torn vessels.

POST-PARTUM HAEMORRHAGE.

Most authorities are agreed that postpartum haemorrhage is of more common occurrence after placenta praevia than after ordinary labours. There is greater divergence of opinion, however, regarding the cause of the haemorrhage. Kellogg asserts that the usual explanation is atony of the isthmus. He says that Von Jasche ascribes half the deaths in cases of placenta praevia to bleeding produced by dilatation of the lower uterine segment, during the 3rd stage of labour, or immediately afterwards. Hofmeier is reported by Kellogg to disagree with this view, and to state that there is little danger of haemorrhage resulting from lack of contraction of the lower uterine segment, and only when placenta praevia and placenta increta co-exist will excessive haemorrhage occur. Kellogg, who, although he had few postmortem examinations, attributes half of his deaths to rupture of the uterus, considers the satisfactory explanation of the cause of the haemorrhage to be that/

that offered by J.S. Newell. Newell discovered that in certain post-mortem examinations there was an intact external cervical ring, but above, in the lower uterine segment, there was seen a split at the placental site extending into the musculature, and permitting haemorrhage from the deep vessels and sinuses. It may be deduced that the split was due to trauma predisposed to by the increased vascularity and friability of the lower uterine segment in placenta praevia. Schoenholz thinks that penetration of the villi diminishes the elasticity of the uterine wall, and that atony, adhesion of the placenta, and rupture of the isthmus are all factors in promoting postpartum haemorrhage. In his opinion, spontaneous lacerations occur more frequently in placenta praevia than in any other complication of labour. Lieberman notes that 36.7% of his cases had postpartum haemorrhage. Polak agrees that many cases die from rupture of the lower uterine segment. Bell declares that death from placenta praevia is usually due to postpartum haemorrhage, and seldom occurs in an undelivered case or where there is no intra-uterine manipulation. McKerron of Aberdeen takes a different view from those recorded above. He says that in cases of placenta praevia he has seldom seen a woman lose more blood postpartum than after any normal confinement. He considers that postpartum haemorrhage is due to delivery/

delivery which has been conducted too rapidly. In his cases he found that postpartum haemorrhage was more likely to occur because of an adherent placenta, and this especially in cases of marginal placenta praevia. In my series, manual removal of the placenta was performed in 21 = 10.9% of the cases.

Thus it is found that of these varying views the most outstanding are that postpartum haemorrhage (1) is due to atony of the isthmus; (2) is caused by the normal dilatation of the lower uterine segment in the 3rd stage of labour; (3) only occurs when placenta increta co-exists; (4) occurs on account of rupture of the lower uterine segment either spontaneously or due to Trauma because of too rapid delivery; (5) is more likely to occur because of adherence of the placenta. Probably any of the above reasons may singly or in combination be responsible for postpartum haemorrhage under varying circumstances. Certain it is that the management of the delivery exerts considerable influence. Postpartum haemorrhage is often fatal, not in itself, but because of previous antepartum haemorrhage which has left the patient exsanguinated.

EFFECT/

EFFECT ON LABOUR.

The course of labour is unfavourably affected by placenta praevia in several ways.

PREMATURITY.

In the first place, it is one of the causes of labour occurring prematurely. In this series, as may be seen from Table V, 67% of the labours were premature, 31% occurring between the 8th and 9th months, and 23% between the 7th and 8th months. Labour is precipitated either by the bleeding itself, or because it is so profuse as to call for interference by the obstetrician, whose main aim, on account of the danger of profuse and unexpected haemorrhage, is to have the labour accomplished as quickly and safely as possible.

TABLE V.

Maturity.

Month at which labour occurred.	No. of Cases.	%	
9	64	33	
8½	17	8.8	
8	43	22.5	
7½	19	9.8	
7	26	13.6	67%
6½	4	2.0	
6	12	6.0	
Under 6	7	3.6	

MALPRESENTATION.

Since the placenta in this condition is situated in that part of the uterus which should be accommodating the presenting part of the foetus, it is apparent that it may readily interfere with the vertex adapting itself to the pelvic brim, resulting in a malpresentation of the child. Other factors contributing to malpresentation are prematurity of the foetus, and the fact that the uterus instead of becoming ovoid is kept more spherical in shape than normally by the lower position of the placenta, especially if it be central.

ASSOCIATION OF TOXAEMIA.

Another feature in placenta praevia seems to be its association with toxaemia.

Young is the chief advocate of this, and he refers to Miller's findings of albuminuria in 19 out of 46 cases = 41%, and to the Clinical Report of the Jessop Hospital, Sheffield (1924), in which 17 out of 30 or 56% of the cases of placenta praevia are classed with the toxaemias of pregnancy. Young suggests that the toxaemia, which develops in this connection, is due to absorption from the separated praevia portion of the placenta, which undergoes infarction. Miller supports this view and notes the association of albuminuria with both placenta praevia and accidental haemorrhage, /

haemorrhage, while observing that toxaemia as indicated by albuminuria is less frequent in the former than in the latter condition. He accounts for this relative infrequency of toxaemia in placenta praevia in the following three ways: (1) the area of separated placenta in placenta praevia is comparatively small, and for the production of a moderate degree of toxaemia it is probable that a considerable portion of placenta should undergo degeneration (Young suggests that a half or a third of the placenta must be infarcted for the production of an eclamptic seizure); (2) the possible channels for the exit and absorption of toxic products in placenta praevia are comparatively limited, the separated portion, except in the central variety of praevia, being in more limited contact with the healthy placenta than in accidental haemorrhage. In support of this view, he notes that, out of 11 cases of central placenta praevia, albuminuria was present in 45%, while in 32 partial cases there was albuminuria in only 34%; (3) in the majority of cases of placenta praevia delivery is effected in a relatively short time after the first onset of bleeding. Miller records how in the cases where there was no albuminuria, the average time elapsing between the onset of the first haemorrhage and delivery was approximately 18 hours, whereas in the cases where there was albuminuria the average interval

was/

was 32 hours.

Eden and Holland are not in agreement with the above observer, but assert that while in cases of accidental haemorrhage toxaemic symptoms are associated with 80%, in placenta praevia albuminuria rarely occurs, and that indeed the presence or absence of albuminuria may be regarded as a diagnostic sign, although not an infallible one, in differentiating between the two types of haemorrhage.

The findings resulting from the analysis of my series tend rather to support this latter view, the percentage of patients showing toxaemic symptoms being relatively low; but it must be admitted here that the low figure may be due to the case records being incomplete in regard to this particular aspect. 12 = 6% of the patients gave a history of definite toxaemic symptoms prior to admission, 19 had less definite symptoms such as headache, sickness etc. 36 = 13.5% only, had albumen in the urine in appreciable quantity on admission to Hospital.

INCIDENCE OF MONSTERS.

Various writers note the association of placenta praevia with foetal monstrosities. De Lee says that of 16 monsters in the Chicago Lying-in Hospital 8 = 50% were associated with praevia. He reports

Greenhill/

Greenhill as collecting 45 such cases from literature. Lieberman had 1 anencephalic amongst his 79 cases = 1.2%. Sieben mentions one case where deformity of the hands led to their being mistaken for the feet in utero. De Lee and Greenhill therefore before embarking upon Caesarean Section always send their cases to the X-Ray department, if the condition of their patients so permits, to discover if there be any gross abnormality in the foetus. I found that of all the patients admitted to the Edinburgh Maternity Hospital 1923-27, excluding those suffering from placenta praevia, 0.3% gave birth to monsters, whereas, amongst the cases of placenta praevia, there were 2 cases of monsters - 1 anencephalic and 1 spina bifida - giving a percentage of 1, which is 3 times that of the ordinary incidence. The numbers however are too small to be significant.

MORBIDITY.

A relatively frequent sequel to placenta praevia is puerperal infection, predisposed to by operative interference, serious cervical tears and the diminished resistance of the patient owing to loss of blood. In addition, Schoenholz gives as his reasons for sepsis: the prèmature separation of the placenta, and its manual removal. He quotes Hitschmann's deduction that the mortality from puerperal/

puerperal sepsis in placenta praevia is ten times as great in homes, and twenty times as great in hospital as in an ordinary labour. Bauer had a 31.5% morbidity, Hjelt 27% and Lieberman 10%. The last two consider the association of the number of vaginal examinations. Hjelt states that 11 out of his number were examined per vaginam and 4 were possibly infected by operative procedure. Lieberman says that the average number of vaginal examinations in his septic cases was 2.6 per case as against 1.75 in his nonseptic patients, and that puerperal sepsis can be reduced to a minimum by reducing the number of examinations per vaginam to a minimum. Bell does not allow vaginal examinations in any of his cases of antepartum haemorrhage and makes his diagnosis entirely from the symptoms.

In 31 cases in my series = 16%, the temperature reached 100°F on 2 occasions during the first 8 days of the puerperium, excluding the first 24 hours after delivery. The percentage of the total number of febrile cases out of 8239 deliveries in the Hospital excluding cases of placenta praevia during the years 1923-27 was 6.6%, showing a definite increased liability to sepsis in cases of praevia. The average number of vaginal examinations was 2.4 in febrile cases, and 2 in afebrile cases.

An/

An Analysis of these cases follows:-

14 cases	ordinary puerperal sepsis	-	Recovered
6 "	" " "	-	Died.
1 "	pulmonary condition	-	Recovered.
7 "	followed Caesarean Section	-	Recovered.
1 "	phlegmasia alba dolens	-	Recovered.
1 "	insanity	-	
1 "	recto-vaginal fistula	-	Recovered.

In addition there were 17 cases in which there was an afebrile morbid puerperium = 8.8%. Analysis:-

2 cases	phlegmasia alba dolens	Recovered.
1 "	hemiplegia ? Cerebral thrombosis	
1 "	noted as "Sapraemia-Morbid Puerperium"	Recovered
13 "	haemorrhage -	Died.

DIAGNOSIS.

The utmost importance should be attached to diagnosis of the cause of vaginal haemorrhage during the last three months of pregnancy, and placenta praevia should be suspected until by examination it can definitely be excluded.

A patient suffering from placenta praevia will usually give a history of painless haemorrhage, coming on unexpectedly, and often when she is asleep in bed. Only very occasionally may there be a complaint of slight abdominal pain. Summarising the examination, the details of which have been described in the previous section, it is found that there is no undue increase in the size of the abdomen, and no tenderness over the uterus. Frequently there is a malpresentation of the child. In a primiparous patient the head will be found not engaged, and in a multiparous patient the head will be slow to engage. The os is usually large enough to admit at least one finger. Blood clot will probably first be encountered on examination, and may be distinguished from placenta by the fact that clot is easily broken up, whereas placenta is of more firm consistency. When the clot is removed, the sponge-like placenta may be felt bridging across the os wholly or in part, according as/

as the situation of the placenta is central or partial in relation to a "2 finger os".

Bill, in order to avoid the possibility of infection, makes a practice of never examining his cases of antepartum haemorrhage per vaginam, but bases his diagnosis upon the history, abdominal palpation, auscultation, and rectal examination. In some instances it is impossible to make a diagnosis from the history, especially if there has been any pain. Abdominal palpation may suggest the possibility of placenta praevia if there be a malpresentation of the child, or if the head is above the pelvic brim. Rectal examination may help, but I think that most obstetricians would be loth to commit themselves to a diagnosis of placenta praevia by this method of examination alone. It is doubtful whether auscultation can be of assistance. Having arrived at a diagnosis of placenta praevia by these means it is surely not justifiable to embark upon Caesarean Section without a vaginal examination and if this is not to be the method of treatment a vaginal examination will have to be made in any case to effect vaginal route delivery. It would seem advisable, accordingly, to make a routine vaginal examination, but only when everything which may be necessary for the treatment of his patient has been sterilised and prepared so that/

that it can be used immediately.

Where the cervix is closed, Prof. Munro Kerr advocates the use of a Hegar's dilator in diagnosis, a free escape of blood after the introduction of the dilator denoting placenta praevia.

The condition with which placenta praevia is most likely to be confused is External Accidental Haemorrhage where there occurs premature separation of a normally implanted placenta. Here, however, in addition to vaginal haemorrhage the patient may complain of abdominal pain, which may be so severe as to cause vomiting and fainting, and the abdomen, which may be observed to be larger than it was, occasionally may be tense and tender. But it is when these signs and symptoms are less marked or are not all present that difficulty arises in differentiating between the two conditions, and then the diagnosis must rest upon the result of vaginal examination. In the case of placenta praevia the placenta will be felt, in the case of accidental haemorrhage no placenta will be distinguished. Another point in the differential diagnosis is the presence or absence of albuminuria. Eden and Holland, in particular, draw attention to the fact that in distinguishing between the 2 varieties of antepartum haemorrhage, the presence of albuminuria is in favour of the diagnosis of accidental haemorrhage.

As /

As previously stated, Miller on the other hand, found that placenta praevia, in a large percentage of cases, was associated with albuminuria.

Cases of Vasa Praevia, where there is a velamentous insertion of the umbilical cord, and the vessels bridge across the internal os, may give rise to the same symptoms as placenta praevia, but haemorrhage will only occur when the membranes have ruptured, and the vessels are simultaneously torn through. Thus the bleeding, which will be very profuse, will take place during labour, and along with a flow of liquor amnii. Placenta praevia can only be precluded, however, by vaginal examination.

Carcinoma of the Cervix may exhibit symptoms of intermittent and painless bleeding akin to placenta praevia. Under these circumstances, the age of the patient may give some guidance, for although carcinoma of the cervix may occur at the early age of 27, it is more common between the ages of 40 and 45. Here again a certain diagnosis can only be arrived at by vaginal examination, when in the case of carcinoma the cervix will be found to be irregularly shaped, friable and hard, small portions being easily detached. The discharge will not in all likelihood consist of pure/

pure blood, but may be purulent or foetid, and haemorrhage will very probably be less free than in placenta praevia.

Inspection by Speculum in addition to digital examination will assist in excluding a Fibrous Polypus which gives rise to symptoms like those of cancer of the cervix, namely irregular bleeding and foetid discharge.

Hydatid Mole has been known to proffer difficulty in the differential diagnosis of placenta praevia, and this especially where the patient has a thick abdominal wall through which it is difficult to palpate foetal parts, and where other signs of pregnancy are indefinite. Usually, in contradistinction to placenta praevia, there is a certain amount of abdominal pain, and the discharge, although it may consist of pure blood, often is watery or merely bloodstained. The presence of chorionic villi, having the appearance of white currants, may rarely be detected in the discharge, and are diagnostic of hydatidiform mole.
On examination, the abdomen is found to be abnormally enlarged, the uterus perhaps reaching up to a level above the umbilicus after only 3 months amenorrhea, and on palpation giving a curious feeling of elasticity.
Per/

Per vaginam, instead of feeling foetal parts separated from the examining finger by placenta, there may be tissue yielding a spongy sensation, and behind this nothing firm can be distinguished.

Primary carcinoma of the vagina is a rare condition but should be mentioned since it exhibits similar symptoms to that of placenta praevia. In both conditions, painless haemorrhage is a feature, but in vaginal carcinoma there is a certain amount of foetid discharge in addition. Vaginal examination will settle the diagnosis - the hard, irregular and friable surface betraying a carcinomatous condition.

TREATMENT.

INTRODUCTION.

Prevention would be the ideal in regard to placenta praevia, but, having little knowledge of the cause, and so being unable to foretell the occurrence of the condition, it is, at the present day, necessary to be satisfied by trying to perfect the treatment as far as possible. Only in this way can attempt be made to reduce the associated high maternal and foetal mortality.

It is generally agreed that once placenta praevia is diagnosed, pregnancy should be terminated immediately, lest at a later date a profuse and perhaps fatal haemorrhage should occur before there is time for intervention. There is less unanimity of opinion however, regarding the method of management of delivery, and while one obstetrician brings forward good reasons for treating all cases by Caesarean Section, another will produce equally convincing statistics to uphold another individual method of treatment, such as by version and pulling down a leg, or by means of a hydrostatic bag. Most competent authorities, however, recognise that there is no single method applicable to all cases, and let their choice of treatment depend upon the governing factors in each individual case, such/

such as the degree of praevia, the degree of dilatation of the os; the age, parity, maturity and general condition of the patient, and the presentation of the child.

METHODS IN COMMON USE.

The following are brief outlines, apart from their faults or merits, of the commoner methods in vogue for dealing with placenta praevia.

(a) The membranes may be ruptured to allow the child's head to descend and compress the placenta against its site.

(b) The vagina may be firmly packed to compress the placenta between the head of the child and the cervix, the membranes either being ruptured or left unruptured and a firm abdominal binder applied.

(c) External, bipolar, or internal version may be performed to convert a vertex presentation into a breech. The fingers or hand is then passed through the membranes or placenta, according as the situation of the placenta is partial or central, and a leg pulled down so that it protrudes as the vulva. A weight of about 2 lbs is then attached round the ankle of the foetus and allowed to hang over the foot of the bed. The gentle traction on the leg causes compression/

compression of the placenta with the child's buttocks and thus haemorrhage is controlled. When the cervix is fully dilated, the child may be extracted manually, or forceps may be applied to the aftercoming head.

(d) A hydrostatic bag may be introduced through the membranes or placenta and used as a tampon instead of the breech, a 2 lb weight being attached to the tube of the bag by a strip of gauze, and suspended over the foot of the bed.

(e) A recent method of treatment employed is that introduced by Willett who has devised forceps so constructed as to obtain a grip of the child's scalp. After application, a weight is attached to the forceps and hung over the end of the bed. The idea behind the treatment is that the head is a better plug and dilator than the breech, and less interference is required than when doing a version and pulling down a leg.

(f) Another method of vaginal route delivery is manual dilatation of the os followed by extraction with, or without the aid of forceps.

(g) By Caesarean Section delivery is accomplished by the abdominal route. The Classical operation, where a longitudinal incision is made in the upper part/

part of the uterus, is adopted by most, but some favour transperitoneal vervical section where the child is delivered through the lower uterine segment.

(h) Vaginal Caesarean Section is occasionally performed on cases with a rigid cervix,by operators accustomed to the technique of vaginal operations. By means of this operation,the child is delivered through a slit in the anterior wall of the cervix and lower uterine segment, access to which is obtained through an incision in the anterior vaginal wall, and by pushing up the bladder.

TABLE VI.

The Mortality figures of various writers:-
(a) Where the method of treatment was Caesarian Section.
(b) Where other methods of treatment were employed.

Observers.	Number of cases.	Treatment.	Maternal Mortality.	Foetal Mortality.	Morbidity.
McKerron					
[1]Doderlein		Caesar. Sn.		30%	
[2]Kerr & Holland		"	11.5%	28%	
Jasche		"		40-50%	
Gaenssle			6.4%	6.4%	
Liebe		"(- Braxton Hick's Version.)	1.73%	20.37%	
Bouwer		"	6.0%	17.5%	
Schoenholz		"	2.08%	6.5%	
Mikulicz	31	"	3.3%	16.6%	59.3%
Conrad	51	" Transpl.	9.8%		
Ballhorn		"	0	0	
Calderon and Villarama		"	28%		
Watson & Miller		"	7.6%	7.6%	

		Methods other than Caesarean Section.	Maternal Mortality.	Foetal Mortality.	Morbidity.
McKerron	250	Version	3.6%	?	
Falk	48	Bag	6%	34%	
Gaenssle	186	All vaginal deliveries.	8.6%	54%	
Liebe	88	"	8.68%	51.3%	
Mikulicz	137	"	11.5%	57.84%	42.5%
Kellogg (New York Lying-in Hosp.)	591	Chiefly pack and version.	12.1%	42%	
[3]Kosmack		"	14%	62%	
Watson & Miller		Conservative	9.9%	70.5%	
Kellogg 95-15	152		19.0%		
15-25	151		8.25%	51%	
Hitschmann		Bag & Version	3.6%-19%	34%-70.5%	

1 & 2 Quoted by McKerron.

3 Quoted by Kellogg.

TABLE VII.

Mortality figures quoted by various authors where all methods of treatment were employed.

Author.	No.	Treatment.	% Maternal Mortality.	% Foetal Mortality.	% Morbidity.
Bauer	85	All methods	2.27	31.0	31.5
Hjelt	118	"	5.9	63.5	27
Mikulicz	168	"	16.9		10
Lieberman	79	"	13.79	64.55	
Conrad	203	"	8.8	54	
Costa & Landa	203	"	5.4	54	
R.K. Smith	28	"	0	21	
Brodhead & Langrock	165	"	10.94		
Calderon & Villerama	314	"	16.56	67.18	
Barney	48	"	16	40	
Quoted by Prof. B.P. Watson:-					
1. Miller,F. New Orleans	40	"	20	54	
2. Kellogg, Boston Lying-in	151	"	8.25		
Sloane Hospital	157	"	7	47.4	
3. Essen Moller	132	"	3.7	45	
Watson & Miller	254	"	9.8	66	
				12)606	
				Average 50 Foet. Mort.	
Quoted by Lieberman:-					
1. Doderlein		"	19.0		
2. Kronig		"	18.2		
3. Meade		"	15.0		
4. Lefebre		"	9.3		
5. Chaelaies		"	15.5		
			20)213.6		
			Average 10.6 Mat. Mort.		

REFERENCES.

Tables VI and VII give a general idea of the treatment favoured by a number of obstetricians in terms of the resultant maternal and foetal mortality rates. A glance will show that the results, both to mother and child are best where delivery has been effected by Caesarean Section; nor is this entirely because it was performed upon selected cases. The following summaries of the individual results will explain the reasons for supporting this method of treatment.

Bouwer strongly favours Caesarean Section. He shows by the following Table that his results were more satisfactory both to mother and child, where the treatment was abdominal or Vaginal Caesarean Section.

Method.	No.	Maternal Mortality	Foetal Mortality.
Spont^{s}. Delivery	24	0%	29%
Rupt^{d}. membs.	15	6.7	37.5
Braxton Hicks 'Vers^{n}.	36	8.3	77.8
Metreurysis	16	6.2	56
Vers^{n}. & Extract^{n}.	82	11.0	51
Vag^{l}. Caes^{n}. Sect^{n}.	3	0	0
Abd. " "	34	6.0	17.5

Von/

Von Jasche advocates Caesarean Section. He claims that all living and viable foetuses may be saved by being so treated, that danger of a ruptured uterus is avoided, and that in cervical Caesarean Section the mortality is definitely lower than by older methods of treatment.

Liebe compares 2 sets of cases in different periods. In the first 88 cases in the years 1904-19 the conservative policy of treatment was followed, delivery being spontaneous, metreurysis , and version with extraction. The maternal mortality was 8.68% and the foetal mortality 51.13%. In the second group of 55 cases occurring during the years 1920-24, more active treatment was carried out. 28 were treated by vaginal Caesarean Section, 10 by abdominal cervical Caesarean section, and 10 by Braxton Hick's version. The maternal mortality in this latter series was 1.73% showing a fall of 6.9%, and the foetal mortality was 20.37% showing a fall of 30.76%. Liebe therefore reasonably concludes that active treatment is the most satisfactory, and especially he prefers vaginal Caesarean Section.

Schoenholz is another supporter of treatment by Caesarean Section. He holds that only in this way can there be complete control over the site of implantation/

implantation of the placenta and so over haemorrhage, and that by avoiding over-distension of the lower uterine segment the likelihood of postpartum haemorrhage is decreased. But his conditions for undertaking the operation are that the patient should be clean, and the cervix dilated to not more than 5 cm., unless it be a case of severe haemorrhage and central placenta praevia. In 99 of his cases, 48.5% were treated by Caesarean Section, his maternal mortality being 2.08% as against 5.9%, the mortality figure in those treated by more conservative methods. The foetal mortalities were 6.5% by Caesarean section and 35.5% by conservative methods, showing a very much lower mortality where abdominal section was employed. Schoenholz advises Caesarean section for most cases in hospital, and BraxtonHick's version where treatment has to be carried out at home.

Mikulicz had a lower maternal mortality amongst his cases treated by abdominal section, i.e. a 3.3% mortality in 31 cases so dealt with, against an 11.5% mortality amongst 137 cases treated by the vaginal route. His cases for Caesarean section, it may be noted, only numbered one-fifth of his total. His morbidity rate was higher in cases treated by Caesarean Section, i.e. 59.3%, as compared with 45.2% treated by other methods. This is not surprising on reflecting/

reflecting that all abdominal operations are liable to be followed with some fluctuation of temperature. His foetal mortalities were 55.2% where there was vaginal delivery, and nil on abdominal delivery, results strongly in favour of Caesarean Section.

Ledoux thinks that the ideal treatment for Central placenta praevia is abdominal section with a high fundal incision, provided that the patient is afebrile, has not been subjected to examinations or manipulation, and that the foetus is viable and at term. He thinks that Caesarean Section should be considered if the foetal death is recent. The operation is commended because (a) blood loss is avoided, (b) trauma is minimised, (c) danger of infection is diminished, (d) there is a resultant lower maternal and foetal mortality.

Gaenssle's maternal and foetal mortalities were lower in cases where Caesarean Section had been employed, being 6.4% for both mother and child, and by other methods of treatment 8.6% and 54.0% respectively. He considers that vaginal route delivery should be used for septic cases.

Conrad, without offering much reason, states that he thinks Caesarean Section to be the best form

of treatment for both mother and child. His maternal mortality for all forms of treatment was 8.8%, and where Caesarean Section was done 10%, and the child mortality 54% and 10% respectively. Conrad must evidently consider the child before the mother. He afterwards adds that in 3 cases where transperitoneal cervical Caesarean Section was performed there were no deaths.

Ballhorn strongly advises transperitoneal cervical section in the interest of both mother and child. H. Wagner is of the same opinion.

Bell considers that treatment resolves itself into:(1) replacing loss of blood, (2) delivering his patient in such a manner as will cause the least loss of blood during delivery, and the least danger of postpartum haemorrhage. He would base his observation of the amount of blood loss on the general appearance and apparent condition of the patient, but above all on the blood pressure which he claims should be 90 - 100 systolic and 60 diastolic, and also on the red cell count, which should exceed 3,000,000 per sq. m.m. If these two latter conditions are not fulfilled, a blood transfusion should be given before embarking upon any treatment. Of the 5 deaths which occurred in the first Series A (consisting of 45 cases) which he/

he considers, 1 was due to abdominal complications which might have been avoided, the other was due to postpartum haemorrhage, which he thinks could certainly have been avoided, if the patient had been given a prophylactic blood transfusion. 50% of the cases in Series A, consisting of 45 cases, were treated by Caesarean Section with a maternal mortality of 11.1% and a foetal mortality of 37.3%. In a later series consisting of 56 cases, 71.4% were treated by Caesarean Section with the satisfactory maternal mortality of 1.78% (i.e. only 1 death occurred because the husband would not allow proceedings for 5 hours) and a foetal mortality of 32.1%. In 12.4% blood transfusion was performed.

This second series shows a marked improvement in the maternal mortality with the increased use of Caesarean Section and previous blood transfusion. Caesarean Section is therefore now always performed in both marginal and central varieties of placenta praevia where the os is practically undilated. In a smaller number of cases, where the situation of the placenta is lateral, and the foetal head has descended sufficiently to control haemorrhage, Caesarean Section is of course not executed.

Bell concludes that while Caesarean Section is the method of choice in treating placenta praevia, no method, in the more serious cases, is safe without blood transfusion.

De Lee discussing Bill's paper, is of the opinion that primiparous patients with placenta praevia, whether old or young, should be delivered by Caesarean Section, and that all cases of central placenta praevia should also be treated in this way. He considers that Cervical Caesarean section is safer than the classical operation, as there is less likelihood that the placenta will be cut through.

The above authorities prove fairly conclusively that Caesarean Section in different degrees is attended by better results than any other method of treatment but most of them insist that the patient should be potentially uninfected, the os small and the child viable.

Turning to those favouring other methods of treatment, R. Falk is outstanding in his support of extra-ovular metreurysis. In treating 48 cases thus, he had the relatively low maternal and foetal mortalities of 6% and 34% respectively. He prefers the extra-ovular introduction of the bag, because he maintains that the loss of liquor amnii caused by its intra-ovular use diminishes the available space for the foetus and predisposes to compression of the cord by the bag, and also that it promotes liability to infection. He claims that increased bleeding

only follows if the bag is improperly used. When the bag is expelled the delivery is completed by version of the child and subsequent extraction, version under the circumstances being easy, since the membranes are intact. In central placenta praevia Falk regards the method as advantageous because it avoids tearing of blood vessels while endeavouring to go through the placenta. In his hands this treatment may be satisfactory, but theoretically it is difficult to see the force of his arguments. Preservation of the bag of waters might avoid possible compression of the umbilical cord but surely would detract from efficient compression of the placenta, especially as the shape of the bag does not lend itself to fit into the angle of the area of detachment. The method also seems as if it would add to the risk of infection, since the bag, which has passed through the potentially infective vagina, is placed in direct contact with the gaping vessels.

McKerron of Aberdeen in discussing a paper on the treatment of placenta praevia said that he had not seen a case where Caesarean Section was likely to have better results than version. He had 9 deaths in 250 cases but he says that 4 of these deaths could be discounted, because no treatment could have been of any avail; and this brought his maternal mortality

down/

down to 2%, against Watson's figure of 7% which however included all deaths. McKerron said that he was old-fashioned enough to think that the child must take its chance, and in any case Caesarean Section did not save all children.

Beck discussing Bill's paper, in which Caesarean Section is advocated, declares that he considers all cases of placenta praevia to be potentially infected. He says that his cases were treated by the older methods with results better than those quoted at the Meeting. His treatment was chiefly version, the woman subsequently being allowed to deliver herself. Alternatively his treatment was by bag, afterwards waiting for spontaneous delivery, thus avoiding trauma to the cervix and placental site, and need of anaesthesia, and so postpartum haemorrhage.

There follows records of the results of a series of observers who have used all methods of treatment.

G. Bauer gives a total maternal mortality of 2.2% and a foetal mortality of 31.5%, and this out of 185 cases, giving very low mortality figures. He had only 5 abdominal sections, 6 vaginal Caesarean Sections, 34 spontaneous deliveries, membranes ruptured in 79, version in 45, Braxton Hick's version 8,/

8, metreurysis 4, tamponade 2, forceps 2. He seems to have been fortunate in that there were 34 spontaneous deliveries, and 79 in which all the interference required was rupture of the membranes, that is to say, 60% of his cases must have been mild cases, with probably a lateral type of praevia.

Hjelt also had a relatively low maternal death rate of 5.9%, but the foetal death rate was on the high side, i.e. 63.5%. His methods of delivery in his 118 cases were as follows:- Spontaneous 4; ruptured membranes 37; Braxton Hick's version 26; version with spontaneous delivery 9; podalic version and extraction 10; foot pulled down in 7; Caesarean Section in 7. The remaining 10 were delivered by forceps, hysterectomy, embryotomy etc. The majority therefore were treated by rupture of the membranes or version.

Costa and Landa whose maternal death rate was 5.4% are of the opinion that their high foetal mortality of 54% shows the necessity of sending patients to hospital immediately for Caesarean Section.

Calderon and Villarama give the high mortality figures of 16.56% for the mother and 67.18% for the child, in a total of 314 cases treated. Cases treated by/

by manual dilatation of the os followed by podalic version yielded the highest mortality in his series, namely 30%. The second highest mortality of 28% occurred in cases treated by Caesarean Section. It is explained that the maternal death following this latter method of treatment was due to profound anaemia before the operation. It would seem as if this fatality might have been avoided had a blood transfusion been given prior to the operation.

F.S. Kellogg, after comparing a series of 152 cases treated by accouchement forcé, with a series of 151 cases treated in later years by more conservative methods, mainly by bag, and bipolar version bringing down a leg, found that the maternal mortality dropped from 19% to 8.25%. He was confident that in the ensuing 5 years when instead of 57%, 70-75% were treated by conservative methods from below, there would be a still further decrease in the maternal mortality. His hopes however were not realised, for the mortality mounted to 10.5%. He could therefore only conclude that conservative methods from below were more than twice as safe as accouchement forcé. For the last three 5 year periods, he notes the mortality figures as 36%, 18%, 25%, the last two figures resulting from the most conservative form of/

of treatment, and asks what figures could be worse. He then turns to additional reasons for supporting the treatment by Caesarean Section. As previously mentioned, he believed that half his maternal deaths were due to rupture of the lower uterine segment, and over-dilatation of the segment can only be avoided by delivery from above. He thinks that by this means sepsis is best prevented, hysterectomy being performed when the history of the case makes infection probable; this he concludes remembering that the cardinal pathology of all lethal sepsis is a focus of infection in the torn cervix. In addition, he states that a high proportion of viable babies lost by delivery from below, might be saved by abdominal section. He notes that the results recorded, where the treatment has been Caesarean Section, are as good as any. His figures show a maternal mortality of 12.1%, and 42% still-births. Kosmack's figures from the same institution are 14% and 62% respectively.

Kellogg recommends that: (1) Caesarean Section should be performed on all cases of central placenta praevia whether the baby be viable or non-viable, living or dead; (2) Voorhee's bag should be used for cases of partial placenta praevia; (3) moribund patients should first be transfused. (4) hysterectomy should follow section if there is any risk of sepsis or likelihood of persistent bleeding following section. The number of dependent children should be taken into account and each case should be considered on its own merits.

Lieberman's Series of 29 cases were treated in 19 different ways. The maternal and foetal mortality was highest where version and breech extraction were employed, i.e. 17.7% and 68% respectively, whilst the maternal mortality in cases treated by other methods was 9%, and the foetal mortality 60%. The mortality was nil in 3 cases of classical Caesarean Section, but the foetal mortality was 60%. Voorhee's bag was utilised in 3 cases with no maternal deaths and a foetal mortality of 30%. Lieberman claims that the high mortality in version and breech extraction is accounted for by the fact that the more difficult cases were treated in this way, and it was the most "applicable" method. In spite of his poor results as displayed by his mortality figures, he thinks this latter method of treatment the method of choice, but he thinks it should preferably be preceded by bag induction.

Watson and Miller made an analysis of 279 cases of placenta praevia treated in the Edinburgh Royal Maternity Hospital in the years 1914-24. It will be noted that two of the years overlap two in my series, which covered the years 1923-27. Watson and Miller obtained the best results with the more conservative methods of treatment when either there was no interference at all, or the membranes were ruptured, the maternal/

maternal mortality being nil under these circumstances, and the foetal mortality 41%. And at the other extreme they obtained good results with the radical treatment of Caesarean Section, their maternal and foetal mortalities being 7.1% by this method of treatment. Their highest mortality occurred in cases treated by the intermediate methods of pack and version, bags, bipolar and internal version, which yielded a maternal mortality of just short of 13%, and a foetal mortality of 81%.

It will serve as a useful source of comparison with the cases in my series if the more detailed results in Watson and Miller's findings are set forth, and the records will bring out the marked influence which the situation of the placenta exerted upon the outcome of the different methods of treatment.

In 29 cases where there was no special treatment or where the membranes were ruptured there was no maternal mortality and a 31% foetal mortality. All the cases were partial.

Amongst 8 forceps cases where there was no other treatment, 1 maternal death occurred from eclampsia.

Where pack was used in 21 cases, 1 case being central, the other 20 partial, there were no maternal deaths and a foetal mortality of 57%.

Pack/

Pack followed by version was employed in 50 cases with an 18% maternal mortality and an 84.6% foetal mortality. The situation of the placenta was the chief factor here in causing the high mortality. In 22 cases of partial placenta praevia the maternal mortality was 9%, and in 28 central 25%. The causes of death in the 9 fatal cases were sepsis 4; haemorrhage 3; embolism 1; acute mania 1.

The total number of cases where a hydrostatic bag was used was 14. The maternal mortality was 14.2% and the foetal mortality 67%.

Bipolar version was the method of treatment most commonly adopted in the series. Amongst 67 cases the maternal mortality was 10.4% and the foetal mortality 82%. The importance of the situation of the placenta is emphasised by the fact that in 28 central cases there was an 18% maternal mortality, and in 39 partial a 5.1% mortality. The causes of death were haemorrhage 6; myocarditis 1; unstated 1.

Amongst 48 cases treated by internal version there was a maternal mortality of 10% and a foetal mortality of 77%. In 13 central cases there was a maternal mortality of 31% and a foetal mortality of 93%. In 35 partial cases there was a maternal mortality of 2.8%, and a foetal mortality of 70%. The influence of the situation of the placenta is again notable. The causes of the 5 deaths were: haemorrhage/

haemorrhage 4; sepsis 1.

14 cases were treated by Caesarean Section with a maternal and foetal mortality of 7.1%. In 9 central cases, the one maternal and foetal death occurred both in the same case: in the 5 partial cases there was no maternal or foetal mortality.

In selecting the method of treatment, Watson and Miller emphasise the importance of considering the degree of placenta praevia, the stage of pregnancy, the age and parity of the patient, also, whether she has living children, the state of the parturient passages, the amount of blood lost and the general condition. They consider that the range of application of Caesarean Section ought to be extended to include other cases besides primiparae and cases of central placenta praevia.

Watson in another paper emphasises the importance in dealing with cases of placenta praevia: (1) Of immediate Hospital for the patient; (2) Examination of the patient only after the most careful preparation, and when everything which may be necessary for treatment is at hand; (3) Transfusion when there has been any great loss of blood.

He considers that packing outside Hospital is dangerous when version may afterwards be necessary, and/

and therefore pack should seldom be used. If patient cannot be sent to Hospital the safest procedure for the general practitioner is to do a version and bring down a leg - this of course sacrificing the child.

THE EFFECT OF DIFFERENT METHODS OF TREATMENT UPON THE MOTHER AND CHILD.

The various forms of treatment, and combinations of methods, which were employed in my series of 192 cases, will now be discussed in relation to the maternal and foetal mortalities, taking also into consideration factors such as the situation of the placenta, the size of the os, and the condition of the patient on admission to Hospital. The different methods of treatment will be considered in order of their associated mortality figures, taking Tables IX and X as a guides.

MOTHER.

With regard to the mother, it is noticed that the highest mortality figure, namely 28.5% , occurred in cases delivered by forceps. But only 7 cases were thus dealt with, and except in one case, the application of forceps was preceded by some other method of treatment: bag, version or pack, so that it is not possible to state how far the forceps were to blame for the high mortality. It has already/

TABLE IX.

EFFECT OF DIFFERENT METHODS OF TREATMENT UPON THE MATERNAL AND FOETAL MORTALITIES.

	No. of Cases	% of Total	Mother lived	Mother died	%	Foetus lived	Foetus died	% Mort.	No.	%	Mother lived	Mother died	% Mortality	Foetus lived	Foetus died	% Mortality.
No Interference	18	9	17	1	5.5	12	6	33	26	13	24	2	8	17	9	34
Ruptured membranes	8	4	7	1	12.5	5	3	37.5								
" " + Pack	7	3.8	7		0	5	2	47.5	18	9	16	2	11	10	8	44
Pack	11	5.7	9	2	18	5	6	54.5								
Pack + forceps	3	1.5	3		0		3	100								
Pack, bag, "	1	0.5		1	100		1	100	7	3.6	5	2	28.5	1	6	86
Forceps	1	0.5	1		0		1	100								
Version + "	2	1	1	1	50	1	1	50								
Leg pulled down.	7	3.6	7		0	1	6	85.7								
External version.	14	7	12	2	14	5	9	64	70	36	66	4	5.7	22	48	80
Bipolar version	32	16	31	1	3	12	20	62.5								
Internal version	17	8.8	16	1	5.7	4	13	76								
Pack, leg pulled down	7	3.6	7		0	1	6	85.7								
Pack + Ext. versn.	1	0.5	1		0		1	100	48	25	38	8	17.4	9	39	81
Pack + Bipol. "	19	9.8	13	6	31.5	3	16	84								
Pack + Intern "	21	10.6	19	2	9.5	5	16	76								
Bag	1	.5	1		0	1		0	3	1.5	3	0	0	1	2	66
Bag + Version	2	1	2		0		2	100								
Caesarean Section	15	7.8	15		0	13	2	13	16	8	16	0	0	14	2	12
Pack + Caesar. "	1	.5	1		0	1		0								
Willett's Forceps.	2	1.0	2		0	1	1	50	4	2	3	1	25	2	2	50
Pack + Willet's Forceps.	2	.5	1	1	50	1	1	50								
Total	192		173	19	9.8	76	116	65%								

TABLE X.

Effects of Situation of Placenta and different methods of treatment on cause of Maternal Death.

	CENTRAL.				PARTIAL.			
	Lived	Died	% Mort.	%	Lived	Died	% Mort.	%
No Interference					17	1	5.7	8
Rupt. Membranes					7	1	12.5	
" "+ pack				100	7		0	6
Pack		1	100		9	1	10	
Pack + Forceps					3		0	
Pack,bag,forceps				100		1	100	16.6
Forceps					1		0	
Version + Forceps		1	100		1		0	
Leg Pulled down	2		0		5		0	
Ext. Version	7			0	5	2	28.5	.8
Bipol. "	4				27	1	3.5	
Int. "	4				12	1	7.6	
Pack,leg pulled down.	3				4		0	
Pack+ Ext.Version	1			25				14.7
" + Bipol. "	3	2	66.6		10	4	28.5	
" + Int. "	5	1	20		14	1	6.6	
Bag					1		0	0
Bag + Version					2		0	
Caesarean Section	8			0	7		0	0
Pack + Caesarean "					1		0	
Willett's Forceps					2		0	25
Pack+ Willetts "					1	1	50	
TOTAL	37	5	9.5%		136	14	9%	

already been pointed out how the increased vascularity and friability of the lower uterine segment, in placenta praevia predisposes to trauma, and it is not difficult to see how final application of forceps would increase the likelihood of the occurrence of a tear. The 2 cases which ended fatally in this series both died from haemorrhage: one from antepartum haemorrhage and post-partum haemorrhage, the other, from post-partum haemorrhage and shock. It cannot be urged that the patients' condition on admission influenced the result to any marked extent, the pulse rates being 100 and 108 per minute respectively, but in one of the cases which ended fatally the situation of the placenta was central.

The next highest mortality of 25% was that observed where Willett's Forceps were used. Only 4 cases were so treated, so that no conclusions can be drawn from the results. The one death which occurred took place in a woman who was admitted to Hospital "bleeding profusely" with a pulse of ? 130, and respirations of 30 per minute, so that it is unlikely that any method of treatment directed at delivery would have been of avail in saving her, although benefit might have been derived from a blood transfusion. It would seem that the method of treatment has not yet been given a fair trial. Theoretically it is deserving of such, at any rate in a case of partial placenta praevia, where the vertex is presenting/

presenting and the occiput anterior, for compression of the placental site by the head will surely be more effective than compression by the less hard and less well-fitting breech. The forceps, however, do not seem to obtain an entirely satisfactory hold upon the scalp, for it is recorded in one case that the forceps slipped off on two occasions.

The majority, i.e. 118 or 61% of the cases were treated by version alone or version preceded by vaginal pack. Out of 48 cases treated by version only, the mortality was 5.7%, and of 70 cases treated by pack followed by version, there was a 15.5% mortality, i.e. a 10% difference in favour of treatment by version alone. The increased death rate where pack was employed prior to version may be mainly attributed to sepsis, for 5 deaths out of 8, i.e. 62% of the deaths, were due to this cause, whereas, when version alone was performed, 1 out of 4 deaths, i.e. 25% were due to sepsis, and in this case there was difficult extraction of the child causing a ruptured uterus. The sepsis where pack preceded version may be ascribed chiefly to the double interference. The pack, saturated as it is with blood serum, makes an ideal breeding place for organisms of the potentially infective vagina, and the added separation of the placenta, produced by the second manipulation of version, gives ready access for the organisms to the/

the blood stream. On analysing the total number of cases where the treatment was pack and version, the size of the os and the general condition of the patient, as estimated from the pulse rate, did not seem to call for this method of treatment in advance of version in the first instance, for, where version was performed at once, the os was '2 fingers dilated' in 48% of the cases, and in 24% the os was only '1 finger dilated' on admission.

Where version was preceded by pack, the os admitted 1 finger in 33% of the cases, and 2 fingers in 39%. Evidently the risk of manual dilatation of the cervix, to a size where it is possible to perform version, is less than the risk of packing and leaving the os to dilate. The pulse rate on admission, of the patients subjected to the 2 methods of treatment, bore close resemblance. Where version was the treatment the pulse was good in 35%, moderate in 51% and poor in 14%. Where pack and version was the treatment, the pulse was good in 35%, moderate in 47% poor in 18%.

IX

From the Table it is seen in connection with the group where pack preceded version, that in both central and partial types of praevia, bipolar version was attended by a higher mortality than internal version, and that, in central placenta praevia, this mortality was higher in both types of version than in either

type/

type of version employed in partial placenta praevia. Actually, external version, although among 7 cases of central praevia there were no deaths, shows the highest death rate of any method of version in partial placenta praevia. Really, however, only 2 deaths occurred, one patient was moribund on admission.

Referring to Table X again, it is notable that in the 17 cases of central placenta praevia, where version was not preceded by pack, there were no deaths, while in 49 cases of partial placenta praevia similarly treated there were 4 deaths = 8% mortality; it is hard to account for, but difference in the total numbers of the central and partial cases may be held to be partially responsible. In the cases where version was preceded by pack, the reverse was the result, the mortality in central cases being higher than in the partial, for in 12 cases of central placenta praevia there was a mortality of 25%, and a 14.7% mortality in 28 cases of partial placenta praevia. Considering central placenta praevia alone, the good results, where version only was performed, suggest that, in this type of praevia particularly, pack should be avoided.

It is difficult to criticise the use of version in relation to other methods of treatment, since it has been employed in so many more cases than the other methods. The results must depend to a certain degree/

degree upon the skill of the operator in performing the version and bringing down a leg, but it is remarkable that although during the 5 years, probably 20 different doctors were in charge of the cases, version, where not preceded by pack, was attended by the second lowest mortality on the list. (See Table IX).

Treatment by Vaginal Pack in 18 cases yielded a mortality of 11%. In 7 cases in which the membranes were ruptured prior to packing, there were no maternal deaths. Where in 11 cases the membranes were not ruptured before packing, the results were attended with a mortality of 18%. The raised mortality in the latter instance is not surprising, for obviously when the uterus contracts down upon the child and forces its head against the placental site, there will be more efficient compression than when the bag of waters intervenes. Pack in this series is shown to be an unsatisfactory method of treatment. In the first place, it has a mortality twice as great as the mortality where version was the treatment, namely 11% against 5.7%. In the second place, pack may not completely control the haemorrhage, and if it has to be followed by version, the fact that the patient has to be exposed to vaginal interference for a second time, is subjected to two anaesthetics, and the fact of the added interval before the haemorrhage/

haemorrhage is controlled all contribute to the raising of the mortality. Some maintain that too tight a pack causes laceration of the cervix, and so increased bleeding. Pack in this series was used in only 1 case of central placenta praevia, and this case ended fatally from ante-partum haemorrhage. The cause of the other deaths, in a patient treated by this method, was also ante-partum haemorrhage, indicating that while the chief danger in pack followed by version is sepsis, haemorrhage is the main danger where pack alone is used.

In the 26 cases in which there was no interference or in which only the membranes were ruptured, 2 deaths occurred, i.e. there was a mortality of 8%. Cases thus dealt with were either those where the placenta was laterally placed and there was little bleeding, or where labour was too far advanced for intervention to be profitable. In 1 case where death occurred the patient was admitted with a pulse of 132, having lost a great deal of blood prior to admission; the membranes were ruptured, and the head descended and controlled the haemorrhage, but the patient died undelivered. The other death was one of the unexplained cases where sepsis followed no intervention, and the patient died on the 16th day. In the first of these cases a blood transfusion would/

surely have helped.

Sufficient reference has already been made to treatment by version. This method unpreceded by pack shows the next highest maternal mortality in the series, i.e. 5.7%.

The use of Champetier de Ribes Bag in 3 cases of partial placenta praevia was unattended by deaths, but the number of cases where this method of treatment was adopted, was so small that no conclusions regarding the advisability of its use can be reached. It would seem that this mode of dealing with placenta praevia would depend, more than any other, upon the technique and dexterity of the operator, for the speed and efficiency with which the bag can be introduced must play a large part in preventing excessive haemorrhage, especially in cases of central placenta praevia. One disadvantage in connection with the use of a bag is that, once it has been introduced, it is not safe to leave the patient lest the bag be suddenly expelled and free haemorrhage occur. In two cases, version had to be performed to control the haemorrhage after the bag had been expelled.

Caesarean Section gives markedly the best results in this series, for out of 16 cases so treated, no maternal deaths occurred. The cases, so far as the size of the os was concerned, were selected, i.e. in/

in 19% the os was closed, in 50% the os was "1 finger dilated", and in 31% the os was "2 fingers dilated". A fairly rapid pulse was not taken to be any contra-indication, for in 13% the pulse rate exceeded 120 per minute, and haemorrhage had been severe in as many as 31%. In 56% the pulse was good, i.e. below 90 in 31%, moderate, i.e. between 90 and 115, the haemorrhage being slight in amount in 19% of the cases, and moderate in 50%. In none of the cases, excepting one had there been any interference prior to the operation. The exception had been packed first, and at the time of the operation the os was large enough to admit 2 fingers plus; the patient had had severe haemorrhage.

In 8 or 50% of the cases, the placenta was centrally situated.

Caesarean section affords the most reliable means of controlling the haemorrhage of the mother. By this means, more blood can be conserved than by any vaginal manipulation, and the child, if mature and alive, may most certainly be saved. The operation should therefore be performed far more frequently than it has been in the past.

In this series the maternal mortality was not on the/

the whole affected by the position of the placenta, for in 42 cases of central placenta praevia the mortality was 9.5%, and in 150 cases of partial placenta praevia 9%, making a difference of only 0.5%. Watson & Miller's series show a difference of 18%; they had about the same percentage of cases of central placenta praevia as in my series, i.e. 25% versus my 21%, but their mortality was higher, i.e. 22% against my 9.5%. In partial placenta praevia their mortality was lower than in my series, i.e. 4% against 9%. I think that the improvement of 12.5% in my series may be largely attributed to the increased number of cases treated by Caesarean section, for 19% of the total number of cases in my series were so treated without any fatality, against Watson & Miller's 9.8%; they had 1 death. In my series, of the 37 cases of central placenta praevia, 8 = 21.6% were treated by Caesarean section, and the remainder all but 2 were treated by version, or pack and version. The causes of the 5 deaths occurring in Central placenta praevia were all different.

CHILD./

TABLE XII.

Prematurity as a Factor in Cause of Foetal Deaths.

	Over 8 months				Under 8 months			
	Lived	Died	%		Lived	Died	%	
No interference	9	4	36.3	35%	3	2	40	33%
Rupt. Membranes	4	3	42.8		1	0	0	
" " + pack	5	2	28.5	42%				50%
Pack	3	4	57		2	2	50	
Pack & Forceps		2	100			1	100	
Pack, bag, forceps		1	100	83%				100%
Forceps		1	100					
Version & Forceps	1	1	50					
Breech - leg down	1	1	50			5	100	
Ext. Version	4	5	44	69.6%	1	4	80	80.6%
Bipol. "	8	10	55.5		4	10	71	
Int. "	3	7	70		1	6	85.7	
Breech, pack and leg down.	1	1	50			5	100	
Pack & Ext.Version		1	100	76.6%				88.8%
" + Bipol. "	3	11	78.5			5	100	
" + Int. "	3	10	76.9		2	6	75	
Bag	1		0	66.6%				
Bag & Version		2	100					
Caesarean	11	2	15	13%	2	0	0	0
Pack & Caesarean	1		0					
Willetts		1	100	66%	1		0	0
Pack & Willetts	1	1	50					
TOTAL	59	70	54%		17	46	79%	

39.6% of the still births occurred in premature children.

CHILD.

In considering the effect of different kinds of treatment upon the child, the maturity must be taken into account, as well as the situation of the placenta. Those foetuses of under 8 months gestation accounted for 39.6% of the foetal deaths, there being a difference of 25% between the mortality figures in premature and mature foetuses, i.e. there were 7.9% deaths amongst premature foetuses and 54% of over 8 months gestation (See Table XII). Watson and Miller's series showed a difference of 36%, their total number of stillbirths coinciding exactly with those in my series, namely, 48%. The position of the placenta plays a considerable part in regard to the foetal mortality. In the present series, there was a 70.7% mortality in 31 cases of central placenta praevia, against a 61.5% mortality in 151 cases of partial placenta praevia, i.e. a difference of 9% between the mortalities in the two types of praevia. Watson and Miller's showed a greater difference, i.e, a difference of 23%, their mortality figures being 82.7% in central cases, and 59% in partial. This again is, I think, partly due to the increased number of cases of central placenta praevia in which Caesarean Section was performed.

As in the case of the mothers, delivery by forceps/

forceps was accompanied by the highest mortality, i.e. the high figure of 86% in the case of the child, or 83% where the foetuses were mature. Of the 6 deaths which occurred, only 1 foetus was premature; another foetal death occurred in a case of central placenta praevia. While the maternal deaths accounted for the death of 2 of the foetuses, in only 1 other case was delivery by forceps effected without any other prior method of treatment. In this case the foetal heart was heard when forceps were applied, and forceps might therefore be considered responsible for the child's death. It may however be affirmed with regard to the other cases, that while the life of the foetus was first endangered by pack, version,or bag, all by pressure causing interference with the foetal circulation, the fact of 6 deaths occurring out of 7 cases suggests that the final application of forceps further lessened the child's chance of survival.

As regards the child, where the treatment was version, the difference between the mortality figures (a), where version alone was the treatment and (b), where version was preceded by pack, was negligible, the figures being as high as 80% with the former, and 81% under the latter method of treatment. Watson and Miller found in their series that where version was preceded by pack, the foetal mortality was slightly lower/

lower than where the treatment was version only, i.e. 74% against 78%, their maternal mortality, however, being higher as in my series (i.e. 9% with pack, 51% without pack). Prematurity was responsible for 52% of the deaths where version alone was the treatment, the mortality in mature infants being 69.6%; and responsible for fewer, i.e. 41% of the deaths, where version was preceded by pack, reducing the mortality to a lesser degree, i.e. to 76.6%. These modified mortality figures bring out the fact that as with the mother so with the child, there is added danger from the double interference of pack and version. In the cases where version only was performed, the child was alive in 75% of the cases before the manipulation was carried out. In the cases where pack preceded version, mention was not made as to whether or not the foetal heart could be heard immediately prior to performing version.

In the 6 cases of central placenta praevia where version was performed, there was a 75.5% mortality, and in 36 cases of partial placenta praevia a 66.6% foetal mortality, i.e. a lower mortality in this type of praevia, in contradistinction to the maternal figures, which showed a higher mortality in partial placenta praevia. With the use of pack and version in 15 cases of central placenta praevia, there was an attendant high mortality of 93%, and in 33 cases of partial placenta praevia a 75.6% mortality, i.e. the mortality/

TABLE XI.

Effects of Situation of Placenta and different methods of treatment on cause of Foetal Death.

	CENTRAL.				PARTIAL.			
	Lived.	Died.	% Mort.	%	Lived.	Died.	% Mort.	%
No Interference					12	6	30	34
Rupt. Membranes					5	3	37.5	
" " and pack				100	5	2	28.5	41
Pack		1	100		5	5	50	
Pack & forceps						3	100	
Pack, bag & forceps				100		1	100	83
Forceps						1	100	
Version & forceps		1	100		1		0	
Leg pulled down		1	100		1	5	83	
Ext. version	2	5	71.5	75	3	4	57.5	66.6
Bipol. "	1	4	80		11	16	59	
Int. "	1	2	66.6		3	11	78	
Pack, leg pulled dn.		4	100		1	2	66.6	
Pack + Ex. version		1	100	93				75.6
" + bipol "	1	3	75		2	13	86.6	
" + int. "		6	100		5	10	66.6	
Bag					1			66.6
Bag & Version						2	100	
Caesarean Section	7	1	12.7	12.7	6	1	14	12.5
Pack & Caesarean "					1		0	
Willett's Forceps					1	1	50	50
Pack & Willett's "					1	1	50	
TOTAL	12	29	70.7		64	87	61.5	

mortality was lower in the latter variety of praevia as in the case of the mother.

The details of the effect of the different kinds of version in relation to the type of praevia may be had from Table XI. The mortality was highest where internal version was performed having a 76% mortality, a 64% mortality where external version was employed (In 1 of the 2 cases which died, the mother was moribund on admission), the lowest mortality occurring with bipolar version, i.e. 62.5%. Actually the method of version has little bearing, for amongst cases where a leg was brought down, the highest mortality occurred where the presentation of the child was a breech, thus obviating the necessity for version.

Wherever the leg is brought down and the breech used as a plug, the child is practically certainly sacrificed. Presumably death occurs because of compression of the cord and the placenta by the breech 'in utero', there thus being interference with the foetal circulation, and also on account of the asphyxia which is the danger in all breech deliveries, because of the liability of the child to breathe before the head can be delivered.

Where Champetier de Ribe's bag was employed the mortality was 66%. Only 3 cases were thus treated, but the mortality is noticeably high. Neither of the

2/

2 deaths occurred in premature children. In all the cases the placenta was centrally situated. In the 2 cases that died, it was necessary to do a version after the bag had been expelled in order to control the haemorrhage; this second manipulation naturally increased the risk to the child.

The use of Willett's Forceps was accompanied by a 50% mortality, i.e. 2 deaths occurred. Neither deaths took place in premature children, but, as stated when considering treatment of the mother, one woman was admitted to Hospital in a moribund condition. In the other case where death of the foetus occurred, the mother had albuminuria, and on admission the foetal heart was not heard. Consequently, I do not think that the results in these cases should detract from the value of Willett's Forceps as a method of treatment. In none of the cases was the placenta centrally situated.

In 18 cases where Pack alone was used, there was a 44% mortality. As with the mother, the mortality was lower where the membranes had previously been ruptured. In the case of the child, there was a 7% difference, i.e. 47.5% as against 54.5% where there had been no prior rupture of the membranes, so that the risk of a protracted labour due to deficiency of liquor/

liquor amnii seemed to be less than the danger encruing from haemorrhage by inefficient compression of the placental site and intact membranes. If the death of premature foetuses, i.e. 50% of the deaths in this group, be excluded the mortality figure is 42%.

The next highest mortality of 34% occurred where there was no interference, or where only the membranes were ruptured. This is a high figure, but, as explained in considering the maternal mortality, it is chiefly due to the fact that the mothers were admitted to Hospital after most of the haemorrhage had taken place, and the bleeding on admission did not call for any interference.
Only 22% of the stillbirths were premature.
Excluding premature children the mortality was raised by 1% to 35%. All the cases dealt with in this way were cases of partial placenta praevia.

Caesarean Section offered far more satisfactory results for the child than any other method of treatment. There was a mortality of 12%, only 1 child dying, and this one was an anencephalic. All the children were mature; 50% were cases of central placenta praevia.

In every type of treatment there was a higher mortality in premature infants, except where there was no interference, and here 2% fewer stillbirths occurred in mature foeti.

MORTALITY FIGURES.

THOSE QUOTED BY OTHER OBSERVERS.

Table VII* gives the maternal and foetal mortalities quoted by 20 observers where all methods of treatment were employed. Amongst those authors who considered more than 40 cases, the maternal mortality varied from 2.2% (the figure given by Bauer) to 20% (Miller of New Orleans' figure) a remarkable variation. But I find that some state a low mortality figure, and then pass on to say that of course they are excluding 3 or 4 cases which came under their influence in a "moribund condition". Since all individuals attach a different meaning to the word "moribund", I have included these patients, "whom no treatment would have saved", in the quoted figures in Table VII. In some cases, however, doubtless there has been no mention by observers themselves of the "moribund" patients, and these having been excluded may explain the very low mortality in some instances.

The foetal mortality figures vary from 31% to 67%, Bauer again heading the list for a low mortality. Only 3 of these authors state the number of those patients who suffered from a morbid puerperium, and here Lieberman leads with a morbidity of 10% against Bauer's 31.5%.

* Page 40b .

PRESENT SERIES.

MOTHER.

Mention has already been made of the maternal mortality in relation to treatment. It will now be profitable to examine the mortality as a whole.

The total death rate for all cases in the years 1923-27 was 2%, the death rate in cases of placenta praevia 9.8%. In the 5 years, placenta praevia was responsible for as many as 10.1% of the deaths which occurred in all patients delivered in the Hospital.

In the following table there is recorded the causes of the deaths.

Causes of Maternal Deaths.

Total No. of deaths 19 = 9.8% mortality.

			Central.	Partial.
Antepartum haemorrhage	4 - 21%	52.6%	1 - 25%	3
Postpartum haemorrhage	1 - 5%			1
Ante- and post-partum haemorrhage	5 - 26%		1 - 20%	4
Heart disease	2 - 10.5%		1 - 50%	1
Pulmonary embolism	1 - 5%		1 - 100%	
Sepsis	6 - 31.5%		1 - 16%	5

It is seen that 10 = 52.6% of the deaths were caused by haemorrhage and that 2 of these deaths = 20%/

20% occurred where the placenta was centrally situated.

The part played by sepsis in the maternal mortality has previously been referred to, and it has been observed that 6 out of the 19 deaths, = 31.5% which occurred in the series, were attributable to this cause.

The placenta was central in 5 = 26.3% of the total number of cases.

CHILD.

In the 5 years 1923-27, amongst all the cases delivered in the Edinburgh Royal Maternity Hospital, there were 7.6% Stillbirths, and 16.5% of these were due to placenta praevia. In the 192 cases of placenta praevia in this series there were 116 stillbirths = 60.4%, and 14 or 7.2% neonatal deaths.

The influence of treatment upon the foetal mortality has already been considered. Other factors which have contributed to the high mortality are contained in the following list.

Factors in Stillbirths (116)

Degree of Praevia.

Type of Praevia.	No. of Cases.	Deaths.	% Mortality.
Central	41	29	70.7%
Partial	151	87	57.6%

Incidental/

Incidental Complications.

Prolapsed cord	-	10	- 8.6%
Macerated	-	6	- 5.1%
Undelivered	-	4	- 3.4%
Monsters	-	2	- 1.0%

(1 anencephalic, 1 spina bifida)

Malpresentations.

Transverse	-	12	- 70.5%
Occipito-Posterior	-	5	- 62.5%
Breech	-	16	- 80%

Factors in Neonatal Deaths. (14)

Degree of Praevia - 100% partial.

Maturity - Mature 10 = 71%, Premature 4 = 28%

Incid^{l}. Complic^{ns}. - 1 was the first of twins.

Malpresentations - Br 2, Tr 2, O.P. 2.

Br = Breech, Tr = Transverse, O.P. = Occipito-Posterior.

One of the most outstanding features is the number of cases of prolapsed cord, accounting for 10 or 8.6% of the stillbirths. Prolapse of the cord is predisposed to by the interference of a partial placenta praevia with the presenting part, and also is due to the fact that the placenta, and with it the insertion of the cord, is situated low down near the cervix, so that the cord is more apt to come down when the membranes rupture or during manipulations.

It/

It is significant that 73% of the total number of malpresentations ended in stillbirth. A breech presentation of course can hardly be said to contribute towards the mortality where pulling down a leg is the treatment.

CONCLUSIONS REGARDING TREATMENT.

The study of the foregoing 192 cases of placenta praevia lead one to conclude that while no individual method of treatment can be considered suitable for every case of placenta praevia, certain methods give outstandingly good results under most circumstances, whilst other forms of treatment in use should be avoided wherever possible. In the light of the results obtained in my series and those to which reference has been made, it is suggested that if the following lines in regard to treatment were pursued, there would in future be an improvement in the maternal and foetal mortality figures.

The first essential in securing a satisfactory outcome is to see the patient at the earliest opportunity after haemorrhage has occurred. With this end in view, all patients seen antenatally should be warned to call in their doctors at once should any bleeding occur. Had measures been taken at an earlier stage, it is probable that in 36.5% of the cases which ended fatally in this series, and which were admitted to hospital with a pulse rate of over 115 per minute, the prognosis would have been altered.

Next, it is eminently desirable that patients be treated in a Hospital or Nursing Home, provided that such/

such accommodation be within reasonable distance of the patient's home. If institutions are not at hand, the private doctor should shoulder the responsibility and deal with the case himself, rather than subject the patient to a long ambulance journey, possibly over a rough road.

The method of treatment adopted must first of all depend upon the condition of the patient when first seen, as estimated by the quality and rate of the pulse, and by her general aspect. If the condition is poor, a blood transfusion should be performed, a list of quickly available universal blood donors being attached to every Maternity Hospital, (by arrangement with a body such as the Boy Scouts). It is probable that in several of the cases in the present series, death might have been prevented, had blood transfusion been performed preliminary to, or coincident with treatment directed at delivery. Blood transfusion is too often a last resort and will be of little avail to a moribund patient.

An important point is to limit the number of vaginal examinations, and so, having had sterilised and prepared all apparatus which might be needed for any form of vaginal route delivery, only one examination per vaginam should be made with all aseptic precautions. The diagnosis of placenta praevia having

having been ascertained, and the position of the placenta determined, the method of treatment decided upon should be carried out forthwith.

In arriving at a decision regarding the most suitable treatment, the age and parity, and stage of pregnancy of the patient, and the maturity of the child should be taken into account, as well as the degree of placenta praevia, the state of the maternal passages, the general condition, and whether or not she has living children. The older the mother, the less likely will she be able to stand much interference and, a fact too often forgotten, more than one anaesthetic. If she be elderly and primiparous and the child viable, although the life of the mother should be of primary importance, the child must also be taken into consideration.

If the 34th week of gestation has not been passed and the bleeding has stopped, pregnancy should be allowed to continue. Otherwise pregnancy should be terminated as soon as possible.

In order to save mother and child the safest treatment has been shown in this series to be Caesarean Section. This should be performed in all possible cases where the position of the placenta is central, whether the patient be multiparous or a primigravida, and in all elderly primiparous patients, whether/

whether the placenta is central or partial. The ideal conditions for the operation are: that the mother's condition be good, that the os should not be more than '1 finger dilated', that there should have been no previous interference other than a vaginal examination conducted in an aseptic manner, and that the child should be viable. But good results have been obtained with a '2 finger' and even '3 finger os', and where there is considerable probability of infection, if the patient has other children, her best chance may be to have Caesarean Section with hysterectomy. Even if the child be dead, if the placenta is central, Caesarean Section is probably the best form of treatment. A rapid pulse, provided the quality be fairly good, is not necessarily any contra-indication to the operation, for in 6 or 36.5% of the cases in which the operation was undertaken in this series, the pulse rate exceeded 115 per minute. Often however, a blood transfusion may be beneficial in the first instance.

Apart from Caesarean Section, Version offers the best chance for the mother; in this series, in cases of central placenta praevia the mortality was nil with version as with Section. On the other hand, version means practically certain sacrifice of the child. The maternal mortality is trebled if version be/

be preceded by vaginal packing, so that where version is conceived as the treatment, it should be carried out in the first instance, pack being employed only in the cases where the os is too small to allow of version being performed. External version should be practised more often, since it must allow of less disturbance to the mother. The method of version as regards the child is of less importance, for the mortality where a leg was pulled down was highest where the presentation was a breech, and version was therefore not necessary.

If the delivery must be effected under domestic conditions, version is the procedure of choice, for packing often cannot be done properly, and being inefficient may have to be followed by version, with marked increase in the risk to the mother, and slight increase to the child.

Treatment by vaginal Pack can only be efficacious where the degree of praevia is slight, and where by means of an abdominal binder, the head can be kept in close contact with the placenta. The patient should be anaesthetised, the vagina and fornices packed tightly by means of a speculum with a broad strip of gauze, and finally a perineal pad attached firmly to the binder. The maternal mortality in the series was twice/

twice that where version was the treatment, although the child had twice as good a chance of surviving where pack was the method employed. The mother always being the first consideration, pack should be avoided except in cases where the os is too small to permit version. It may again be remarked that in this series in 24% of the cases in which version was executed, the os was stated to admit only one finger. Where the degree of praevia is slight and there is little bleeding, and where Caesarean Section is contra-indicated and a living child very desirable, it is also I think justifiable to use pack, thus giving the child twice as good a chance of surviving.

Willett's Forceps. The poor results obtained in this series, where Willett's forceps were employed, were not significant, since the number of cases thus dealt with, were too few from which to draw any conclusions. The method would seem to be deserving of further trial, at all events in cases where the presentation of the child is a vertex with the occiput anterior.

Champetier de Ribes Bag. The results obtained from the introduction of a hydrostatic bag must depend largely upon the dexterity of the obstetrician. In this series, the results were good for the mother and bad/

bad for the child, but the cases so treated were only three in number, so that the issue is of no real import in signifying the value of the method.

Forceps Delivery. This form of delivery was attended by very bad results in this series, but it cannot be proved that the high mortality was directly due to the forceps. It is suggested however that their use should be limited as far as possible in placenta praevia, since their application must tend still further to stretch the friable lower uterine segment, and thus increase the haemorrhage. rupture

No interference or merely Rupture of the Membranes is only justifiable in mild cases of lateral placenta praevia where there is little bleeding and the head well down in the pelvis.

Some cases, pronounced too far gone for interference on admission to Hospital, might rally sufficiently for intervention to be justified, if a blood transfusion was previously given.

SUMMARY OF CONCLUSIONS REGARDING TREATMENT.

1. Once placenta praevia has been diagnosed, immediate steps should be taken to secure early delivery.

2. Patients in a poor condition when first seen, should be given a blood transfusion prior to, or coincident with, treatment directed at delivery.

3. Only one vaginal examination should be made.

4. No interference or merely rupture of the membranes is justifiable only where bleeding is slight and the foetal head well down in the pelvis.

5. Pack should be used when the os is too small to permit version, or, where Caesarean Section is contra-indicated, the degree of praevia and the amount of bleeding is slight, and it is very desirable that the child should survive.

6. Caesarean Section is the method of treatment of election to save mother and child in cases of any severity. It should be performed in all cases of central placenta praevia, and in all primiparous patients where the child is viable. The operation is contra-indicated where the patient is potentially infected although hysterectomy in addition may/

may lessen the risk and it is also undesirable in cases where labour is advanced so that the os is more than 2-3 fingers dilated.

7. Where Caesarean Section is contra-indicated, external version and the bringing down of a leg is the method of choice.

8. Willett's Forceps should be given further trial in cases of lateral placenta praevia where the vertex of the foetus is presenting and the occiput anterior.

9. A hydrostatic bag may be employed with satisfactory results under hospital conditions, but seems to have no advantage over other methods of treatment.

10. No conclusions can be drawn from a study of this series with regard to the advisability of delivery by forceps. It would seem that their use should be limited as far as possible.

MATERNAL DEATHS.

Treatment	Cause of Death	Maturity (months)	Age	Parity	Day after delivery on which death occurred	Central or Partial	Pulse	Os. No. Fingers admitted.	Presentation.
No interference.	Sepsis	F.T.	27	1	16th	P	84	2	Vertex
Ruptured membranes	A.P.H.	8	27	3	Day of manipulns.	P	132	3	"
Pack	A.P.H.	8½	30	1	"	P	108	2	"
	A.P.H.	7	22	2	"	C	104	3	"
Pack, bag, forceps	P.P.H & Shock	F.T.	32	0	"	P	100	2	"
Version, forceps.	A.P.H.& P.P.H.	F.T.	34	0	"	C	108	2	"
Pack & Version 1	Sepsis	6	30	0	18th	P	88	1	"
2	Sepsis	8	22	0	10th	P	100	?	"
3	Sepsis(+ heart)	? 6	38	1	7th	P	76	2	"
4	Sepsis	?F.T.	36	11	29th	C	112	2	"
5	Heart & lung infection	8½	30	3	5th	P	130	3	"
6	Embolism	6	30	2	Day of manipulns.	C	104	2	"
7	A.P.H.& P.P.H.	8	38	13	"	P	112	2	"
8	Cardiac failure (after hydramnios)	8	37	1	"	C	160	2	"
Version 1	A.P.H. (admitted moribund)	F.T.	33	7	"	P	160	4	"
2	A.P.H. do.	?8	34	4	"	P	120	2	"
3	A.P.H.& P.P.H.	F.T.	34	4	"	P	96	2	"
4	Ruptured uterus Sepsis.	F.T.	33	3	"	P	108	2	"
Pack & Willetts Forceps	A.P.H.& P.P.H (admitted moribund)	8½	?	4	"	P	?130	3	"

A.P.H. = antepartum haemorrhage.
P.P.H. = postpartum haemorrhage.
F.T. = full-time.

TREATMENT.

No. of Cases						
26	No interference or Ruptured membranes	Responsible for	10.5%	of the	deaths.	
18	Ruptured membranes and Pack	"	10.5%	"	"	
48	Pack and Version	"	42.2%	"	"	
70	Version alone	"	21.1%	"	"	
4	Willett's Forceps	"	5.2%	"	"	
7	Forceps deliveries	"	10.5%	"	"	

MATERNAL DEATHS.

It will be of interest to go over the cases of placenta praevia which ended fatally, in more detail, to consider whether, in the light of what has been said, in regard to treatment, any better results might have been obtained by methods other than those adopted, it being, of course, easy to be wise after the event.

No. 1 - 1503 - Primipara, aged 34; full-time; central placenta praevia; os 2 fingers; pulse 108; admitted after severe haemorrhage; vertex presentation; bipolar version, child extracted by forceps. Died several hours after delivery of ante- and post-partum haemorrhage due to atony + ? trauma.

Blood transfusion might have helped.

Central placenta praevia in a primiparous patient should have called for Caesarean Section.

No. 2 - 1317 - Primipara, aged 30; maturity 6 months; partial placenta praevia; os 1 finger; pulse 88; vertex presentation; admitted after moderate haemorrhage; vaginal pack followed by version and spontaneous delivery - vomited during whole of labour; placenta 'Crèdé.' Died 18 days after delivery of puerperal septicaemia with perimetritis.

Caesarean/

Caesarean Section might have been considered in a primiparous patient with a '1 finger os'. Vaginal route delivery having been deemed advisable, no course was open other than to expose the patient to the risk of infection from packing.

No. 3 - 1151 - Primipara - aged 22; maturity 8 months; partial placenta praevia;'os 2 fingers;' pulse 100; had been having local treatment for cervical erosions; had severe single haemorrhage ½ hour before admission; vaginal pack followed by bipolar version and spontaneous delivery. Died on 10th day of puerperium of general peritonitis and septicaemia.

Death might have been avoided if, instead of pack being followed by version, version had been performed in the first instance. Previous treatment of cervical erosion, and lack of general resistance must also have been to blame for the fatality.

No. 4 - 912 - Primipara, aged 32; full-time; partial placenta praevia; 'os 2 fingers'; pulse 100; admitted after severe haemorrhage; vagina packed, later De Ribe's bag introduced followed by forceps delivery, the cervix being not fully dilated. Died from postpartum haemorrhage due to trauma, atony and shock.

A primiparous patient of this age, a full-time child and a '2 finger os' might have been saved by Caesarean/

Caesarean Section.

There was too much manipulation, and forceps applied where the os was not fully dilated in placenta praevia was surely courting disaster.

No. 5 - 1418 - Para-2, aged 30; maturity 6 months; central placenta praevia; had repeated haemorrhages throughout pregnancy; packed by doctor; pulse 104 on admission; 'os 1 finger'; vagina re-packed later, bipolar version, and foot having been brought down patient died immediately from pulmonary embolism.

The number of manipulations probably predisposed to embolism. No other course could have been followed if, as is suggested, it was not possible to do a version on admission.

No. 6 - 533 - Para 11, aged 36; full-time; had slight bleedings throughout pregnancy and severe haemorrhage prior to admission; central placenta praevia; 'os 2 fingers'; pulse 112; vagina packed and re-packed; later, bipolar version and child extracted; placenta manually removed. Died of septicaemia 26 days after delivery.

Caesarean Section with sterilisation might have been considered with advantage, taking into account the parity and age of the patient and the central situation of the placenta. The operation might have been preceded by blood transfusion.

No.7 - 1281 - Para 3, aged 30; maturity 8½ months; after severe haemorrhage was packed by doctor before admission; partial placenta praevia; 'os 3 fingers'; pulse 130; version performed on admission, spontaneous delivery following. Died on 5th day of lobar pneumonia, acute pleurisy with effusion and acute pericarditis with effusion.

Probably version on admission was the wisest course. The case record does not indicate how complications might have been avoided.

A patient with a pulse rate of 130 would have benefited by blood transfusion.

No. 8 - 1312 - Para 1, aged 27; full-time; partial placenta praevia; child delivered spontaneously; no interference; bled profusely during 2nd stage of labour. Died on 16th day of septicaemia complicated by pneumonia.

One of the unexplained cases which died of septicaemia although there was no interference.

No. 9 - 345 - 7-Para, aged 33; full-time; partial placenta praevia; 'os 4 fingers'; pulse 160.
Had had severe haemorrhage; sent to Hospital untreated; condition very poor on admission; bipolar version performed, no subsequent bleeding, intravenous gum acacia saline given. Died undelivered of

antepartum/

antepartum haemorrhage.

The outcome would probably have been altered had the 'outside doctor' performed a version when he first saw her, especially since she was para-7 and a living child was not of great importance.

The condition of the patient on admission to Hospital suggested that blood transfusion coincident with version would have proved beneficial.

No. 10 - 1673 - 1-Para, aged 30; maturity 8½ months; partial placenta praevia. Had sudden severe haemorrhage before admission; pulse 108; 'os 2 fingers'; vagina packed tightly, given course of pituitary, spontaneous delivery; placenta manually removed. Died 2 hours after delivery from antepartum haemorrhage and shock.

The severity of the bleeding before admission called for treatment, where control of the bleeding would be more certain than it could be where pack was used. A '2 finger os' should have allowed of version being performed.

No. 11 - 1770 - 13-para, aged 38, maturity 8 months; partial placenta praevia; os admitted 2 fingers; pulse 112. Severe haemorrhage began 6 hours after commencement of labour. Vagina packed; later, pack removed, membranes ruptured and internal version performed; child/

child extracted, placenta immediately followed. Died 1 hour later of antepartum haemorrhage and slight post-partum haemorrhage.

A better result might have been obtained had the membranes been ruptured before packing. It is probable that version would have been the safest procedure.

No. 12 - 140 - 4-para, aged 34, maturity 8 months; os admitted 2 fingers; pulse 120; partial placenta praevia. Had severe vaginal haemorrhage 3 hours after commencement of labour. Still oozing on admission to Hospital; external version performed, spontaneous delivery, no further bleeding. Died 4 hours after delivery of ante-partum haemorrhage.

The Patient would have benefited by blood transfusion on admission.

No. 13 - 63 - 3-para, aged 27; maturity 8 months; os admitted 3 fingers; pulse 132; partial placenta praevia. Had severe haemorrhage several hours after commencement of labour pains; sent in by doctor from Falkirk unpacked. Membranes ruptured on admission, head immediately became fixed and bleeding stopped. Died undelivered 5 hours after admission from antepartum haemorrhage.

Death due to doctor sending patient a considerable distance untreated. Patient would most likely have/

have been saved had version been performed by the 'outside doctor.' Blood transfusion on admission might have been of advantage.

No. 14 - 40 - 2-para, aged 22; maturity 7 months; os '3 fingers dilated'; pulse 104. Had haemorrhage 12 days prior to admission and on day of admission; looked pale on admission. Central placenta praevia. Day after admission had a sudden vaginal haemorrhage; vagina packed. Died 5 hours afterwards of antepartum haemorrhage.

This case affords an example of the danger of temporising.

No. 15 - 307 - 3-para, aged 33; full-time; partial placenta praevia; os '2 fingers dilated'; pulse 108. Had severe haemorrhage at beginning of labour; internal version performed, breech extraction, difficulty with aftercoming head which had to be perforated, placenta had to be removed manually. Died 6 days after delivery from septicaemia due to ruptured uterus, tear in the anterior vaginal wall extending into the lower uterine segment.

Where the placenta is in the way of the presenting part it is difficult to ascertain whether the head will go down into the pelvis, it could therefore hardly have been foreseen that Caesarean Section would in all likelihood have saved the patient.

No. 16 - 1792. 4-para, aged ?, maturity 8½ months; os admitted 3 fingers; pulse ? 130; partial placenta praevia. Bleeding commenced on day of admission; patient very collapsed. Pack had been inserted on district; on admission Willett's Forceps were applied; spontaneous delivery; blood transfusion. Died 5 hours after admission from antepartum haemorrhage and post-partum haemorrhage.

Pack is here again shown to be an unsatisfactory form of treatment. Version in the first place might have saved the patient.

No. 17 - 1726. 4-para, aged 34; full-time; os admitted 2 fingers; pulse 96; partial placenta praevia. Had bleeding 2 days and 1 day before admission, and profuse haemorrhage on day of admission. External version followed by breech extraction; moderate postpartum haemorrhage; uterus packed. Died 4½ hours after admission from ante- and post-partum haemorrhage.

It is difficult to account for death in this case.

No. 18 - 155. 1-para, aged 37; maturity 8 months; central placenta praevia; os '2 fingers dilated'; pulse 160; hydramnios. Bleeding 1 month before admission, severe haemorrhage just before admission, found/

found pulseless by doctor who packed vagina; re-packed on admission to Hospital, internal version following. Died undelivered 22 hours after admission from ante-partum haemorrhage and cardiac failure following escape of fluid from uterus.

No. 19 - 357. 1-para, aged 38; maturity 6 months; os '2 fingers dilated'; pulse 76; partial placenta praevia. Sudden bleeding from vagina on day of admission, preceded by pain; vagina packed with iodoform gauze; bipolar version later, spontaneous delivery. Died of septicaemia 7 days after delivery. Had "double mitral and aortic murmurs".

This case affords another instance of death from sepsis where version was preceded by packing.

REFERENCES.

Gilliat. "Placenta Praevia in Four Successive Pregnancies". Clinic. Journ. (London) 1924, Liii,298.

Falk, R. "Intra or Extra-ovular Metreurysis in Placenta Praevia". Monatsschrift für Geburtshülfe und Gynakologie 1923, LXIV,145.

Von Jasche - "Justification for Caesarean Section in Placenta Praevia". Archiv. fuer Gynäkologie 1923,CXVII

Gaenssle, H. "Treatment of Placenta Praevia". Archiv. fuer Gynakologie, 1923, CXVIII, 120.

Liebe, W. "Treatment of Placenta Praevia". Monatsschrift für Geburtshülfe und Gynekologie, 1924, LXV, 279.

Bouwer. "Caesarean Section in Placenta Praevia". Nederlandsch Maandschrift voor Geneeskunde, 1924, XII, 269.

Schoenholz,L. "Treatment of Placenta Praevia". Monatsschrift für Geburtshulfe and Gynäkologie, 1924, LXV, 112.

Bauer, G. "Results of Treatment of Placenta Praevia in the Obstetrical Department of the General Hospital of Malinö". Acta Gynecologica Scandinavia 1924, iii, 236.

Hjelt, Sally. "Cases of Placenta Praevia at Helsingfors Maternity Hospital, 1910-24". Finska,Laekaresaellskapets Hardbinger,1925-LXVII,238.

Mikülicz - Radecki: "Prognosis and Treatment of Placenta Praevia. A Study of 168 cases". Archiv. fuer Gynaekologie 1924, CXXII,245.

Kellogg,F.S. "Treatment of Placenta Praevia based on a Study of 303 consecutive cases at the Boston Lying-in Hospital". Amer. Journ. Obstets. & Gyn. Vol.XI, 1926.

Porter/

Porter, F. Miles. Fort Wayne . Amer. Journ. Obstets. 1926. p.253. (Discussion on Kellogg's views).

Smith, R.K. "Caesarean Section for Haemorrhage". California and Western Medicine, San Francisco 24: 33-144, Jan. 1926.

Polak, J.O., Brooklyn, N.Y. Amer. Journ. Obstets. 1926, p.252. (Discussion on Kellogg's views).

Liebeman, B.L. "An Analysis of 79 cases of Placenta Praevia". Amer. Journ. Obstets. 1926. p.814.

Conrad, G. "Treatment of Placenta Praevia". Zentralblott für Gynackologie, Leipzig 49: 225-288, Jan.31. 1925.

Ballhorn. "Treatment of Placenta Praevia". Archiv. für Gynäkologie, Berlin, 123:337-806, 1925.

Wagner, H. "Zeitschrift für Geb. und Gynäkologie, Stuttgart, 89: 497-709, 1926.

Ledoux, L.A. "Surgical versus Non-Surgical Management Of Placenta Praevia", New Orleans Medical and Surgical Journal 79: 477-552, 1927.

Costa, N.P. & Landa, P.A. - Boletin de la Soc. de Obstetrics et ginec , Buenos Ayres, 4:377-446, 1926.

Brodhead, G.L. & Langrock, E.G. Surgery Gynecology, & Obstetrics, Chicago 44: 1-144, 1927.

Greenbill. "The Association of Foetal Monstrosities with Placenta Praevia". Surg. Gyn. & Obstets. XXXII, 523, 1921.

McCarthy, T. "Placenta Praevia in four successive Pregnancies". Brit. Med. Journ. Jan.21st,1928.

Sieben, H. "A Complication of Placenta Praevia". " Zentralblott für Gynäkologie, Leipzig,p.2292.

Calderon, F. and Villarama,A. "Treatment of Placenta Praevia". Philippine Islands, Med. Assoc.

Barney, W.R. "Placenta Praevia and Ablatio Placenta", Ohio State Med. Journ. Columbus 21: 801-872, 1925.

Bill, H. "Treatment of Placenta Praevia by Prophyllactic Blood Transfusion". Amer. Journ. Obstet. & Gyn. Oct. 1927.

Watson/

Watson, B.P. New York. (Discussion on Bill's Paper). Amer. Journ. Obstets. & Gyn. Oct. 1927.

De Lee, J.B. Chicago, Ill. (Discussion on Bill's Paper) Amer. Journ. Obstets. & Gyn. Oct. 1927.

Beck, A.C. Brooklyn, N.Y. (Discussion on Bill's Paper) Amer. Journ. Obstets. & Gyn. Oct. 1927.

Watson, B.P. & Miller, D. "Treatment of Placenta Praevia". Transactns. Edin. Obstet. Soc. LXXXIV. 1924-25.

Whitridge Williams. "Placenta Praevia". "Obstetrics". 1925, p.927.

Eden & Holland. "Placenta Praevia". "Manuel of Mid-:wifery", 6th Edition, p.991, 330.

Young, James. "Recurrent Pregnancy. Toxaemia and its relation to placental damage". Edin. Med. Journ. April 1927, pp.61-73.

Miller, Douglas. "Albuminuria in Placenta Praevia". Edin. Med. Journ. April 1924, p.629.

McKerron. (Discussion on Watson & Miller's Paper). Transact. Edin. Obstet. Societ. LXXXIV, 1924-25.

Munro Kerr. (Discussion on Watson & Miller's Paper). Transact. Edin. Obstet. Societ. LXXXIV, 1924-25.

I am greatly indebted to Prof. R.W. Johnstone for permission to gain access to the case records of the Edinburgh Royal Maternity Hospital, and also to Dr Douglas Miller for much helpful advice and criticism.
